ARCHITECTURE DEPARTMENT

MASTER OF ARCHITECTURE PROGRAMME

CHINESE UNIVERSITY OF HONG KONG

2006-2007 DESIGN REPORT

BEYOND MASSIVE ATTACK: MTR AS A CATALYST FOR REVITALIZATION BY RETAINING LOCAL QUALITIES

CHU Pak Lin, Parry May 2007


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Design Report:
Beyond Massive Attack - MTR as a catalyst for revitalization by retaining local qualities

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CONTENT:

1.0 Thesis Statement

Thesis Statment

Underground is a complex system in modern city which stitches various parts of a city. Beside its pure function of carrying people around, it acts as a catalyst for urban transformation process in old districts.

In a way, modernization is necessary in old districts by upgrading the standard of living. Or otherwise, these old districts may gradually disappear by losing their vitality. However, the new "underground" system may only evades these historical part by creating new and generic communities with indifferent programme and character, which is a massive attack to the old district.

With a search for a mechanism that can enhance the transformation process, while retaining their original nature of these old districts. The thesis is targeted to 1) explore an alternative solution by sensitive adaptation instead of typical tabula rasa approach and 2) retain and revitalizing the unique character and identity of old districts.

2.0 Background Information

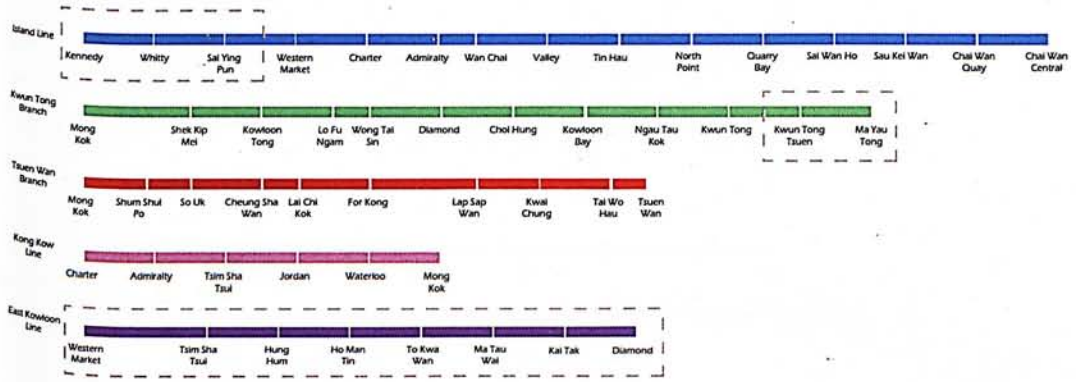
MTR History

Since operations began in 1979, the MTR Railway has become one of the most important elements of Hong Kong's transportation network.

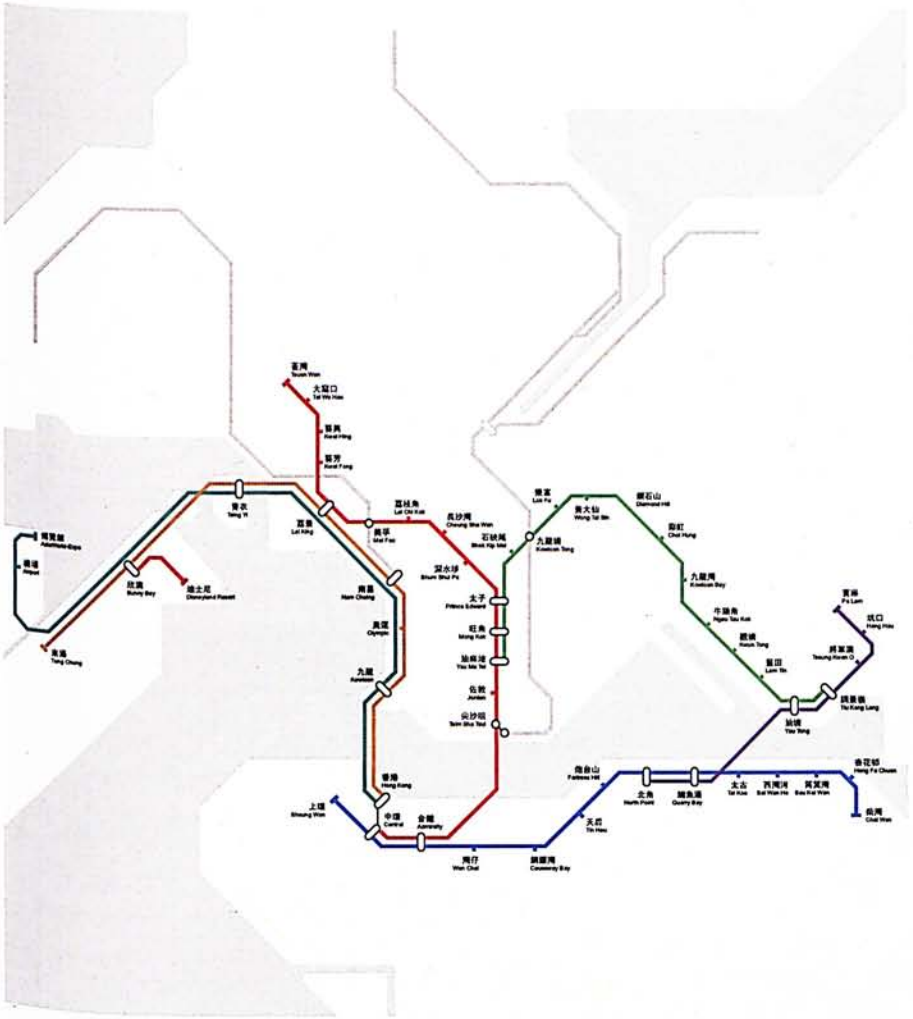
With a railway network of 87.7 kilometres route with 50 stations, the MTR carries over 2.3 million passengers a day - one of the most intensively utilized systems in the world.

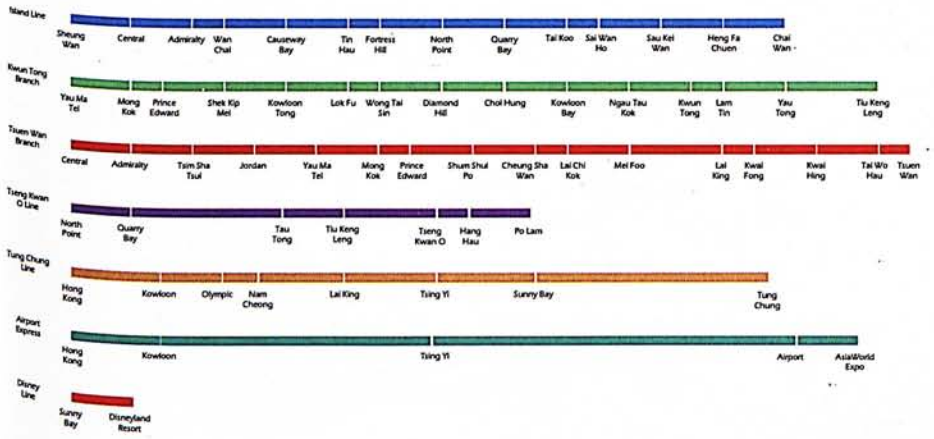
To meet escalating passenger demands, the Corporation expanded its train fleet from 140 cars in 1979 to 1,050 cars in 2002 (including 88 cars for the Airport Express), 86% of which are in service to meet the daily morning peak demand.

Significant progress has been made with the construction of new lines and associated property developments. The Tseung Kwan O Extension is the newest line to be completed and commenced service in August 2002. Earlier in July 2002, the MTR was awarded both the Penny's Bay Rail Link and the Tung Chung Cable Car projects. Consultation is now in progress on the proposed South Island Line and West Island Line as a railway alternative to the transport needs of the west and south sides of Hong Kong Island.

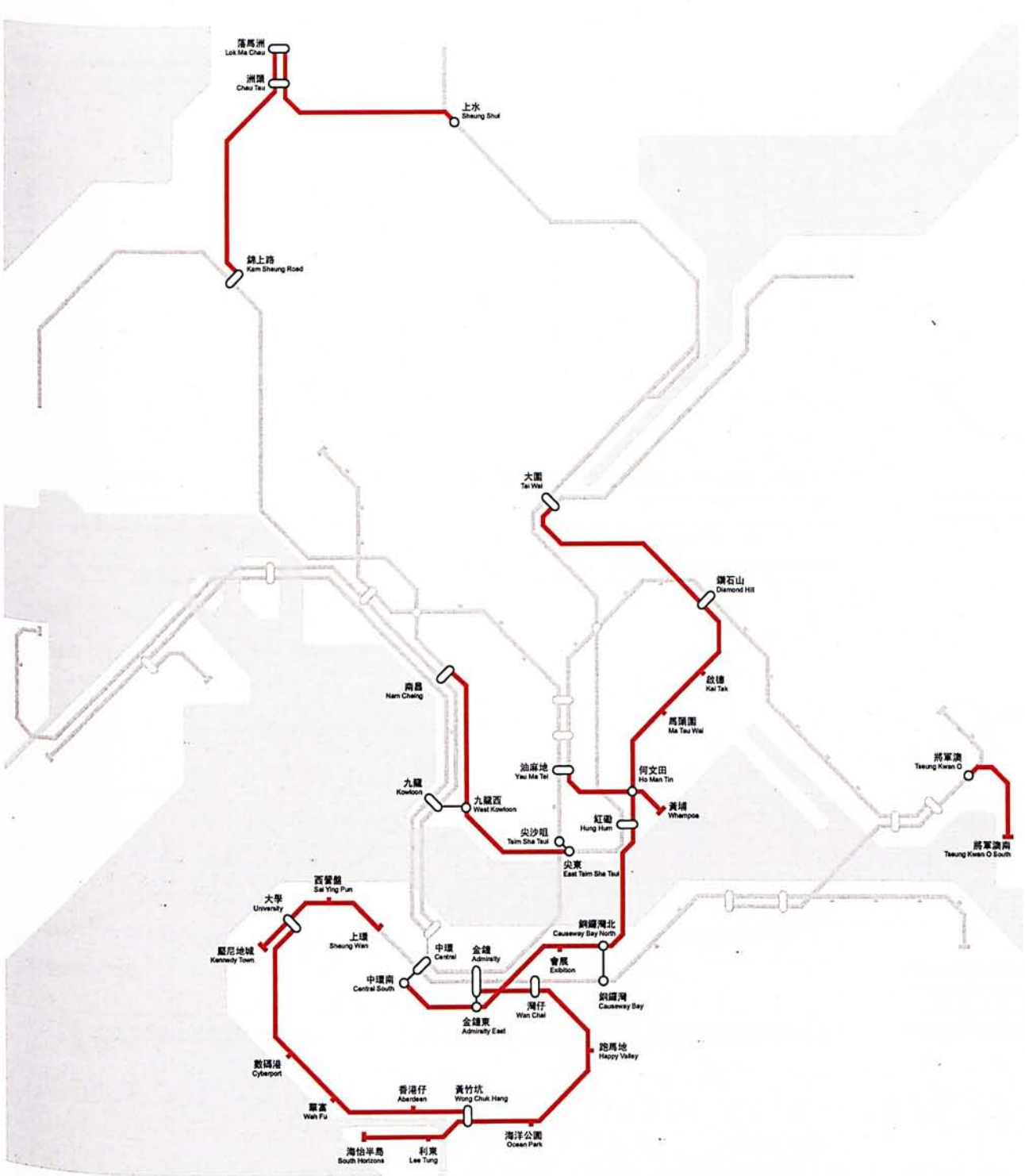


Existing MTR System





Future Development of Railway System



ANALYSIS OF PUBLIC TRANSPORT IN HONG KONG

表 2.1S ：按公共交通營辦商劃分的公共交通平均每日乘客人次

Table 2.1S : Average Daily Public Transport Passenger by Public Transport Operator

2006/07

千次

(thousands)

年/月 Year/Month	專營巴士 Franchised Buses						鐵路 Railways						
							地鐵 MTR		九廣鐵路 KCRC				
	九巴 KMB	城巴 Citybus	新巴 NWFB	龍運 LWB	新大嶼山巴士 NLB	小計 Sub-total	本地線 (1) Local Line (1)	機場快線 (2) AEL (2)	東鐵 (3) East Rail (3)	西鐵 (4) West Rail (4)	輕便鐵路 Light Rail	電車 Hongkong Tramways	小計 Sub-total
2001	3 044.3	593.1	532.8	52.1	18.7	4 241.0	2 077.9	24.7	801.9	-	319.5	239.6	3 463.5
2002	3 107.8	603.8	535.5	55.6	24.5	4 327.3	2 129.3	23.2	812.2	-	313.6	238.7	3 517.0
2003	2 905.5	568.0	494.6	52.8	26.5	4 047.5	2 110.7	18.8	763.4	105.7 (5)	291.4	223.7	3 411.6 (5)
2004	2 906.7	576.0	504.5	60.9	32.9	4 081.0	2 277.5	21.9	803.5	130.6	359.8	232.0	3 825.3
2005	2 767.0	561.9	486.2	66.6	36.6	3 918.2	2 350.6	23.3	895.9	177.4	373.0	230.7	4 050.9
2005 / 05	2 736.9	556.4	475.7	63.6	36.3	3 868.9	2 270.2	21.7	867.0	168.7	377.4	227.3	3 932.2
06	2 708.8	551.7	469.6	63.8	33.7	3 827.6	2 335.3	22.4	859.9	172.5	387.9	219.9	3 998.0
07	2 736.4	565.3	489.9	67.2	37.4	3 896.2	2 398.4	23.8	894.5	175.1	369.1	224.9	4 086.0
08	2 716.5	565.2	482.6	72.1	36.5	3 872.9	2 429.5	23.7	912.2	178.1	356.2	221.0	4 120.8
09	2 787.2	566.9	494.0	68.8	35.5	3 952.5	2 382.7	23.5	903.8	186.4	389.4	225.0	4 110.8
10	2 818.7	579.8	506.0	69.4	39.8	4 013.8	2 373.4	24.3	923.6	188.4	383.3	238.0	4 131.0
11	2 849.2	582.1	511.0	70.7	39.1	4 052.1	2 421.7	24.3	929.8	193.8	384.9	243.2	4 197.6
12	2 789.2	553.9	479.5	70.8	37.4	3 930.8	2 483.4	25.1	939.9	194.3	372.9	235.7	4 251.2
2006 / 01	2 757.2	559.6	493.8	67.9	37.5	3 916.1	2 351.4	24.9	926.5	190.4	371.0	236.7	4 100.8
02	2 784.2	565.2	494.0	71.2	40.3	3 954.9	2 357.5	24.1	929.2	191.8	372.4	235.6	4 110.6
03	2 769.3	562.3	497.1	68.7	35.4	3 932.7	2 360.1	24.2	919.1	194.0	371.3	234.5	4 103.2
04	2 707.1	554.0	488.6	72.3	39.4	3 861.4	2 213.2	29.1	929.2	186.3	356.8	227.3	3 941.8
05	2 717.7	553.1	489.2	69.4	37.9	3 867.3	2 261.7	23.3	882.8	191.4	377.1	225.5	3 961.8
06	2 699.6	558.0	491.1	72.3	36.6	3 857.5	2 327.0	24.1	880.0	193.3	377.2	220.1	4 021.7
07	2 710.7	568.0	498.7	74.2	38.4	3 890.1	2 391.8	26.4	903.5	195.2	373.1	217.4	4 107.3

註：

(1) 地鐵本地線包括觀塘線、荃灣線、港島線、東涌線、將軍澳線及迪士尼線。迪士尼線在2005年8月1日開辦。

(2) 地鐵機場快線包括博覽館站。博覽館站在2005年12月20日啓用。

(3) 九廣鐵路東鐵包括馬鞍山鐵路。九廣鐵路東鐵尖東站在2004年10月24日啓用。馬鞍山鐵路在2004年12月21日開辦。

(4) 九廣鐵路西鐵在2003年12月20日開辦。

(5) 由於九廣鐵路西鐵於2003年只營辦了12天，因此個別鐵路的平均每日乘客人次的數字加起來不等於鐵路的小計。

Notes:

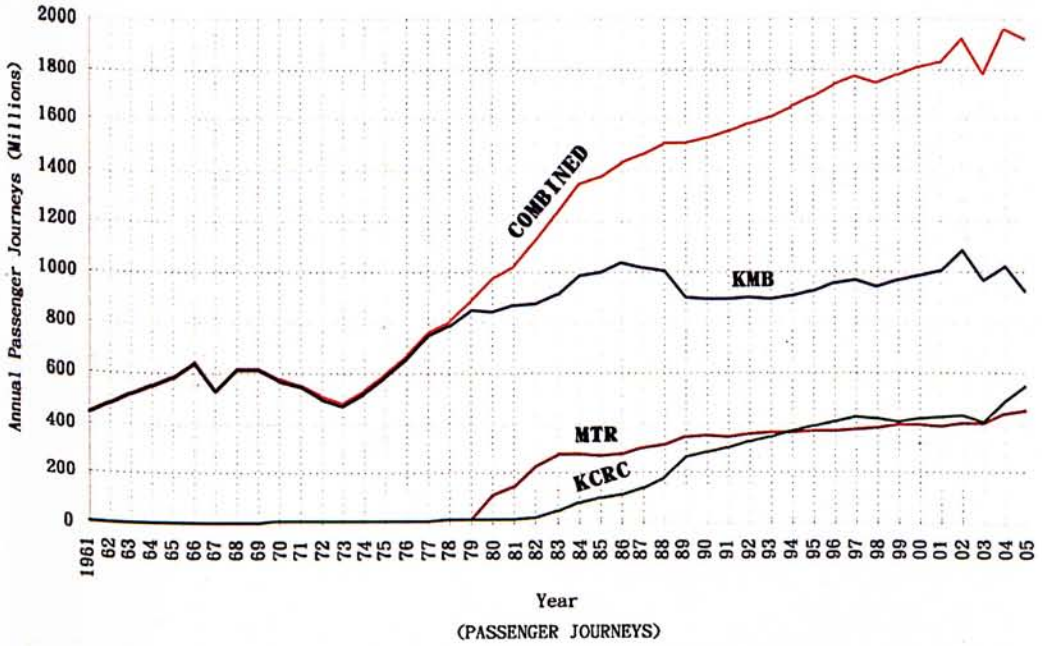
(1) MTR Local Line includes Kwun Tong Line, Tsuen Wan Line, Island Line, Tung Chung Line, Tseung Kwan O Line and Disneyland Resort Line. Disneyland Resort Line was introduced on 1.8.2005.

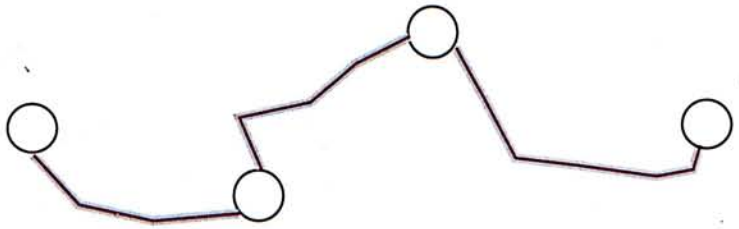
(2) MTR AEL includes AsiaWorld-Expo Station. AsiaWorld-Expo Station was introduced on 20.12.2005.

(3) KCRC East Rail includes Ma On Shan Rail. KCRC East Tsim Sha Tsui Station of East Rail was introduced on 24.10.2004. KCRC Ma On Shan Rail was introduced on 21.12.2004.

(4) KCRC West Rail was introduced on 20.12.2003.

(5) The average daily patronage figures for individual rails do not add up to the sub-total of railways since KCRC West Rail only operated for 12 days in 2003.





Route of buses and vehicle have zig-zag route as to follow the topography and street pattern of the city.

Linear route of railway with straight direct linkage from point to point.

The main different between bus and railway is that the route of the former must follow the topograpy and street pattern of the city. In case of railway, especially the underground, it provide a direct linkage whatever the topogarphy of the site. It thus further enhances the mobility of people by minimizing the travelling distance.

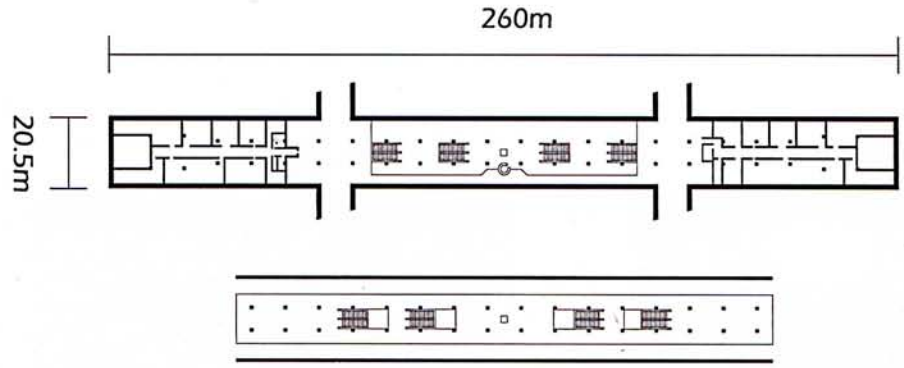
3.0 Architectural Issues of MTR Station & Underground Space

"If on arriving at Trude I had not read the city's name written in big letters, I would have thought I was landing at the same airport from which I had taken off.....The suburbs they drove me through were no different from the other....the downtown streets display goods, packages, signs that had no change at all....only the name of airport changes."

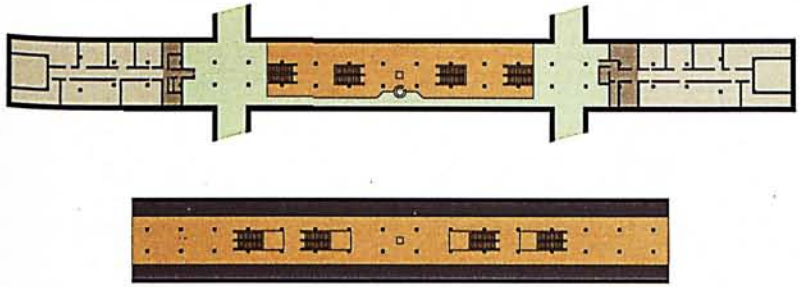
Continuous City 1, Invisible Cities

Generic Design of MTR Station

FORM - Analysis of Standard MTR Station

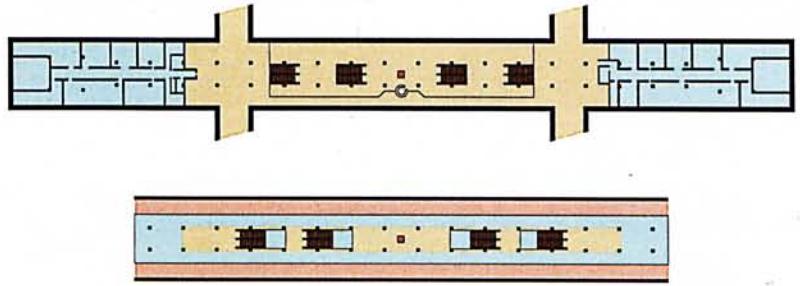


Basic Layout Dimension



Function of Space

- Non-Paid Area
- Paid Area
- Custom Service
- Back of House
- Platform

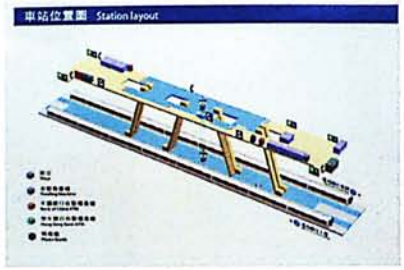
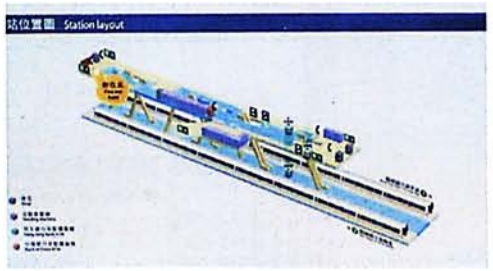
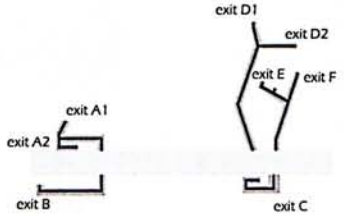
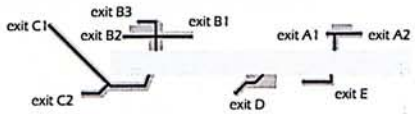
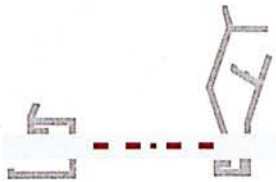
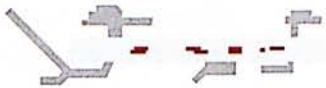


Speed passing through the space

- 0 - 0.5 m/s (still or very slow movement)
- 0.5 - 1 m/s (vertical circulation)
- 1 - 2 m/s (walking & running)
- > 2 m/s (mechanical accelerated)

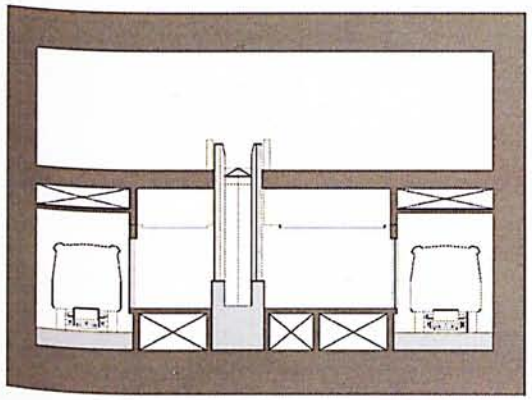
Generic Design of MTR Station

FORM - Analysis of Circulation of Existing MTR Station

	tai koo station	kowloon tong station	yau tong station
MTR Station			
Exit Route			
Vertical Circulation			

Generic Design of MTR Station

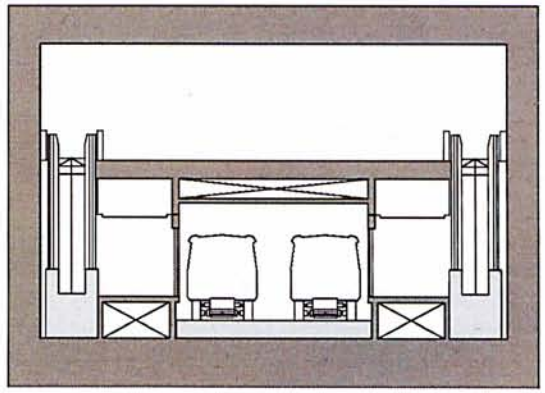
FORM - Section Analysis of Standard MTR Station



Type 1 Station

Island platform and the tracks at two sides

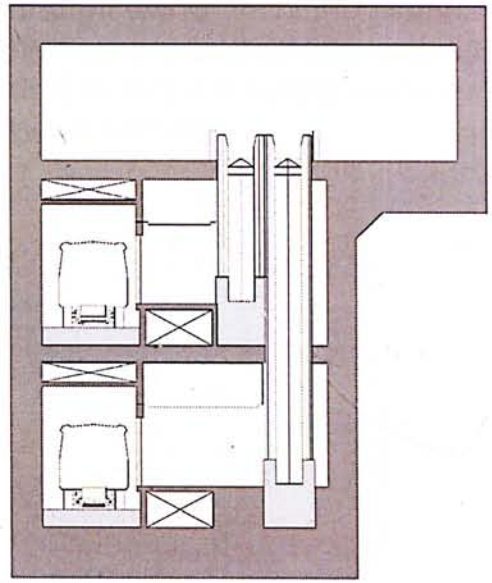
Advantage:
Two track shared the same platform and minimized the number of vertical circulation



Type 2 Station

Tracks at centre and the Platform at two sides

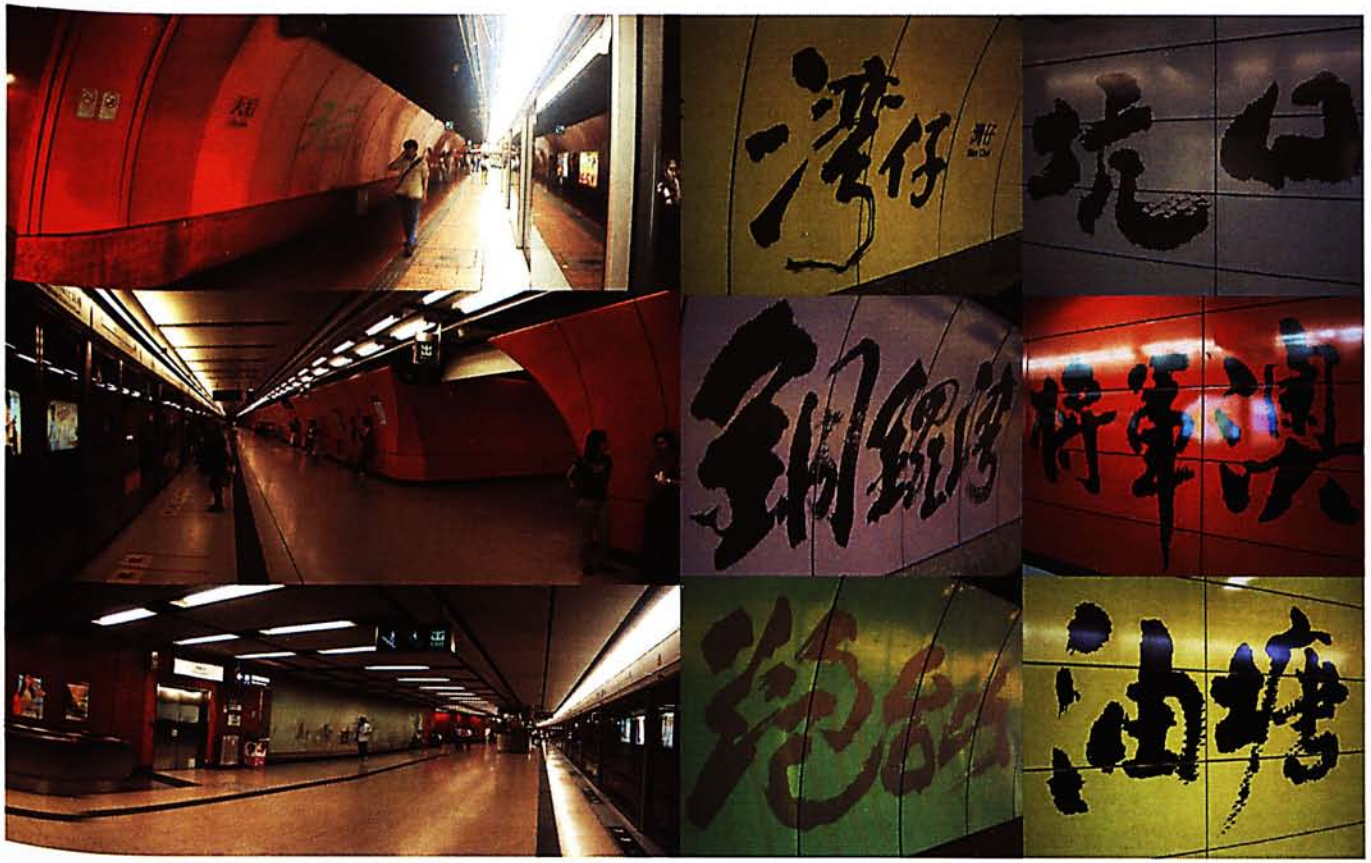
Advantage:
Usually appear in station on ground level or viaduct. the area occupied by the track is minimized

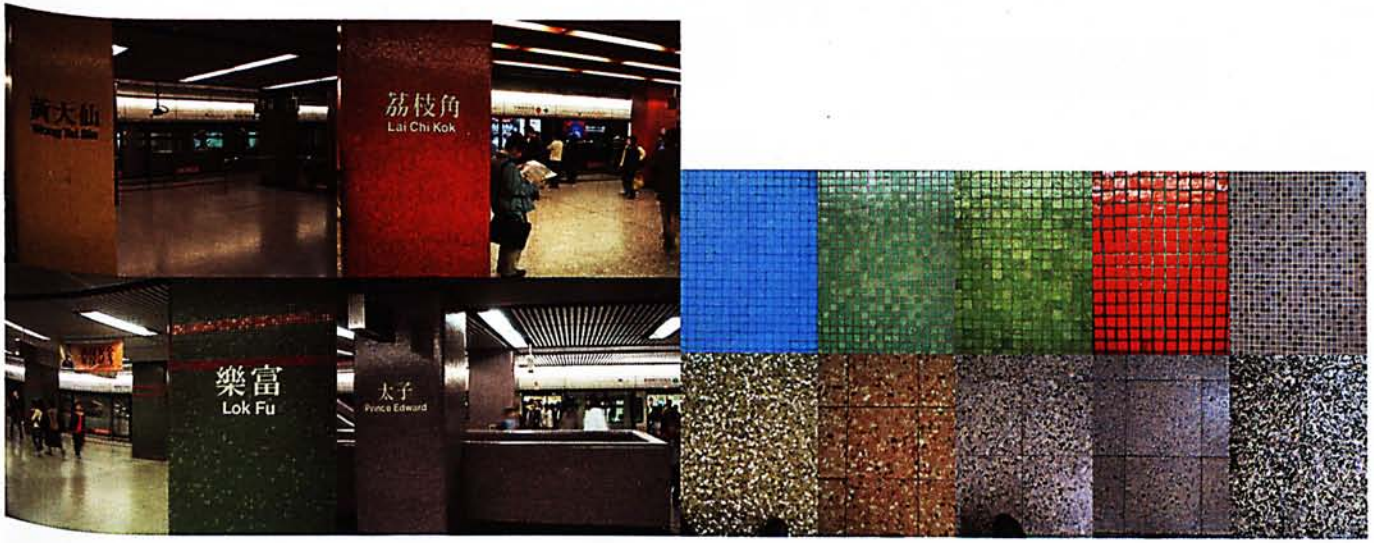


Type 3 Station

Seperate levels of platform

Advantage:
Minimized the area for excavation





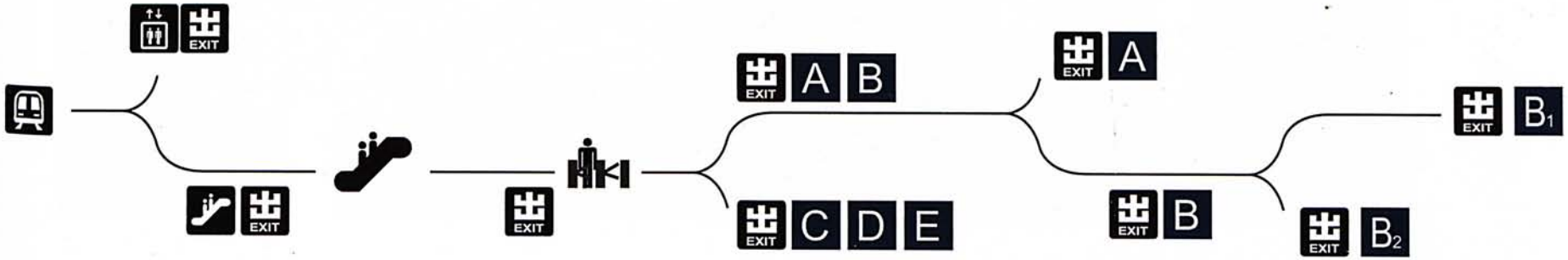
Generic Design of MTR Station

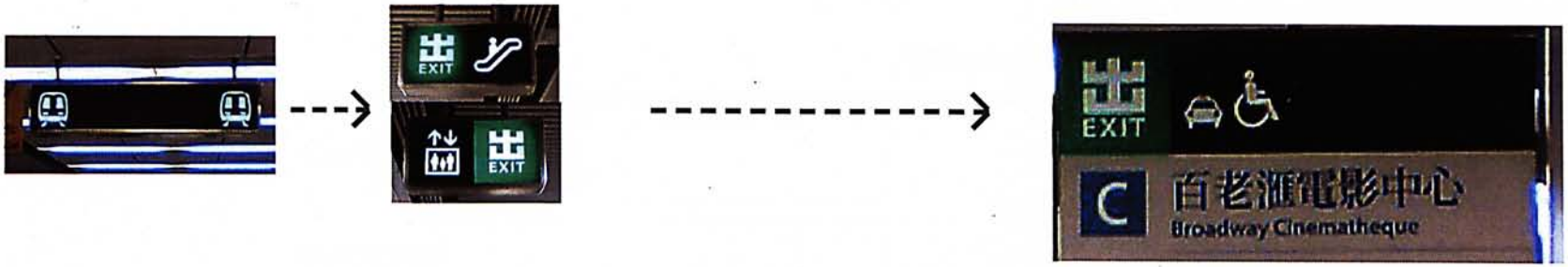
MATERIAL & TEXTURE

The interior spaces of MTR is standardized, no matter on spatial layout and finishes. Floor height is constant with 2.7m high; column and floor are finished with enamel panel or tiles. It is a place with no unique identity

Robotic Direction

The interior spaces of MTR is standardized, no matter on spatial layout and finishes. Floor height is constant with 2.7m high; column and floor are finished with enamel panel or tiles. It is a place with no unique identity





Segregation

The The conventional design of concourse is a closed "container". Subtle passage through escalators is available. This design eliminates the sunlight and the important "transition space" in-between the underground and ground level. Further integration of the concourse and the outside may be a possible solution.

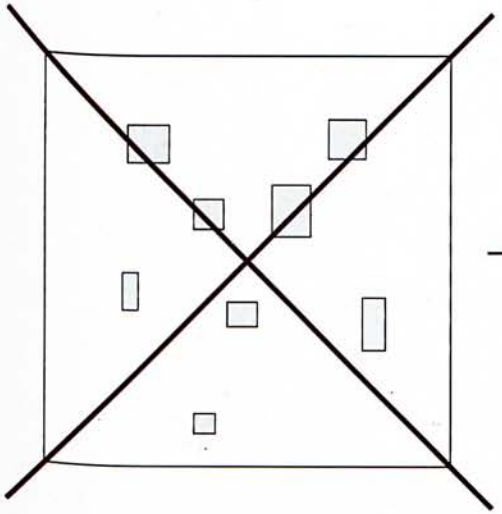
Underground spaces have psychological and physiological effects on people. Many people may feel confined and threatened in such small inner spaces with low ceiling; long and narrow subway to the entrance similar to claustrophobia.

The underground space is lit up by the artificial lighting, instead of natural light, which is always constant. The lack of important sensory impressions impairs the feeling of being able to control the direct surrounding.

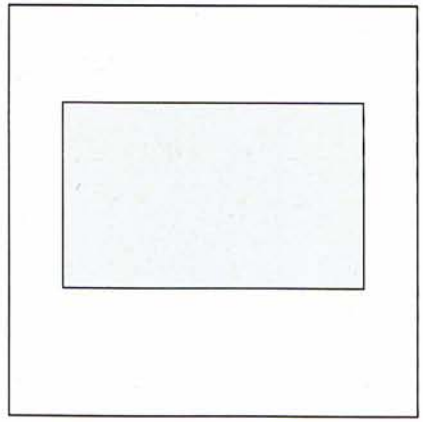
	Aboveground
Concourse	
Platform	

Erasure of Old City

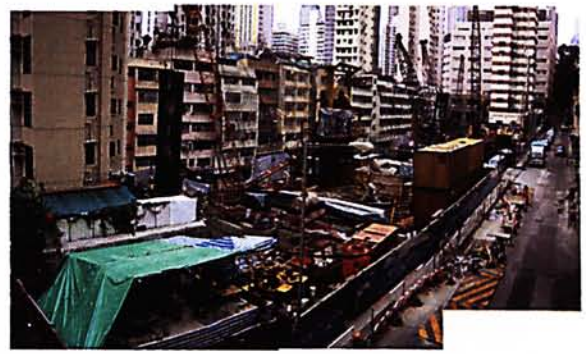
Due to profit-based aim, the developments over the MTR are all expanded vertically in contrast to the existing urban fabric which is the typical podium-tower scheme above the station or entrance.They have seldom considered their effect on the existing urban fabric and destroy the original street proportion of the district.



Removal of original fabric



Podium-Tower



Boredom of Underground

Underground space are commonly environmentally unacceptable in terms of light, temperature, and sound, and generally depressing, as expressed in this painting by George Tocker. The long straight retaining wall create a long continuous space which convey a sense of unpleasant, boring enclosure, which like a chaotic and temporary urban jail, involuntarily entered and gladly left.

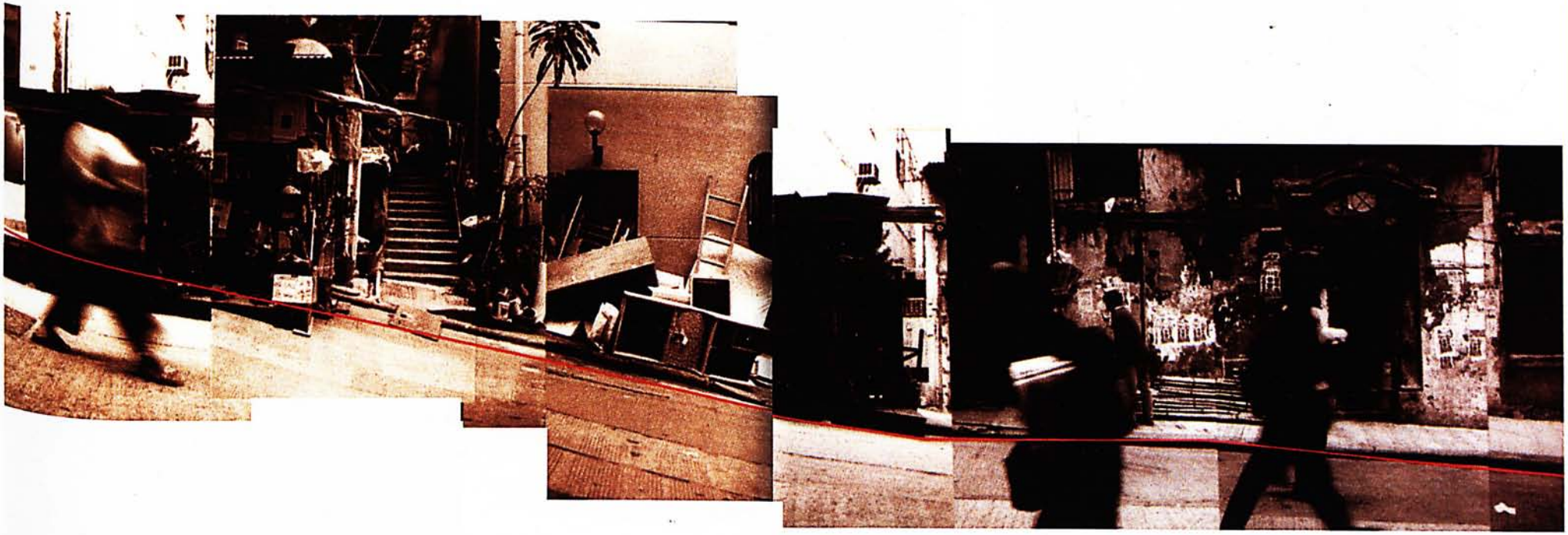
"The Subway" by George Tocker, 1950

4.0 Research & Approaches

Porosity

SPATIAL POROSITY

In the essay Naples in Arcade Project, Walter Benjamin was facinated by Naples urban space which is a condition he called Spatial Porosity. Spatial porosity means in one instance the permeation of privacy by communal life, the interpenetration of day and night, street and home.It was a bridge between action and architecture and highlightedthe improvised character of everyday life as dramatic performance. Benjamin also hinted at the confluence of public life and private rituals in Naples as a possible situation in which modern city life can coexist with local sub-cultures.



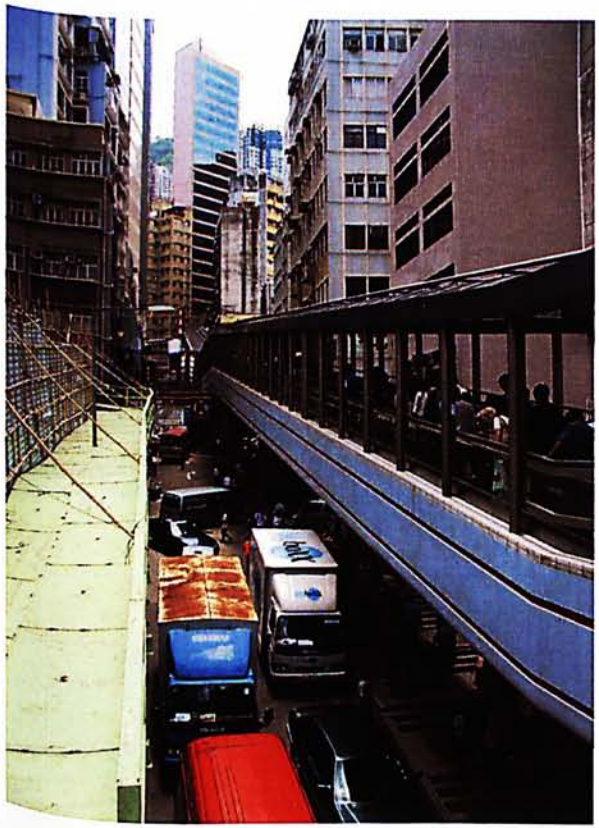
Case Studies: Terrace in Hong Kong Island

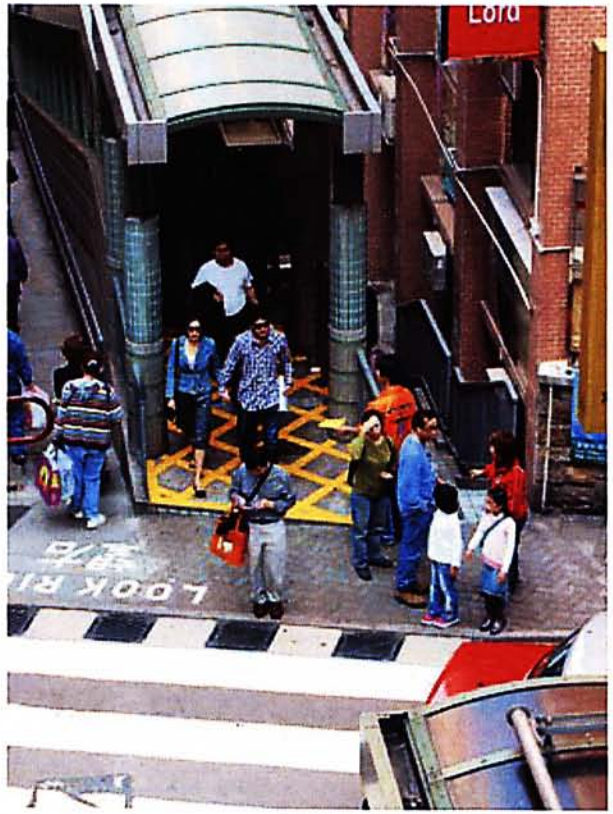
Porosity

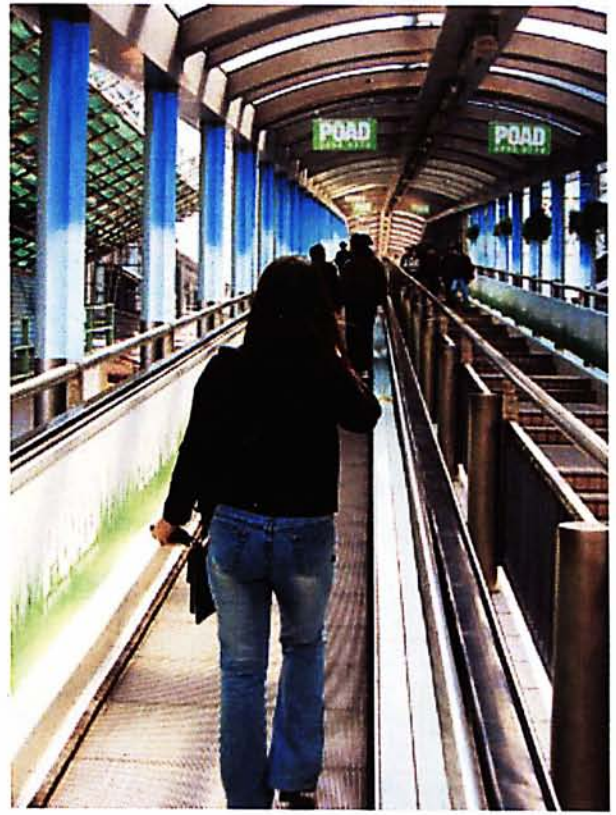
POROSITY OF TIME

Case Studies: Mid-level Escalator

- Completely exterior meandering through the fabric, diving, connecting and merging the urban spaces.
- It makes a number of grade level landings and transfers on street crossing, intersecting the east-west roadways and allow travelers to board and disembark.
- Porosity is signified by overlap of rate - the slow states of repose and comtemplàtion; the gait of pedestrian move up and down hill with mechanical rhythm of infrastructure.
- The gradual momentum of the escalator allows hidden sites and back alleys to be revealed, new shopfront in the air assembled, new meaning and character uneviled.





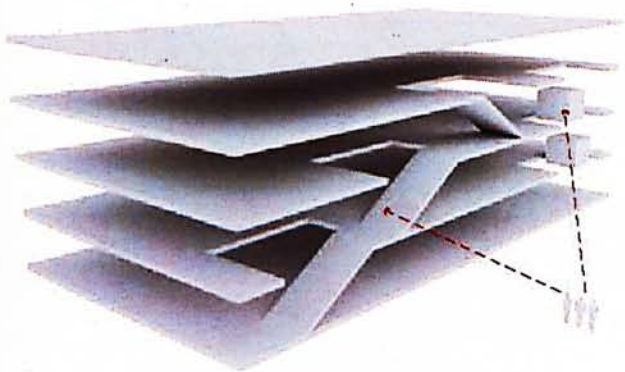


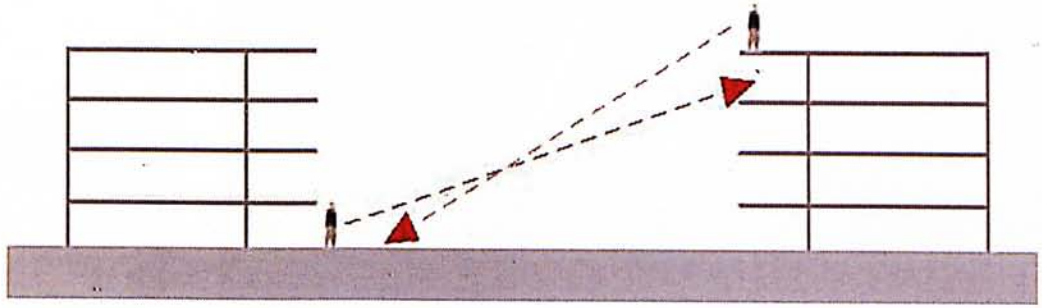
Porosity

VISUAL & SOLAR POROSITY

Case Studies: Canary Wharf Station

- Glass entrance lead sunlight to station for indicating the sense of time and orientation.
- Light intensity gradually increases from platform to entrance. Movement from the entrance to the train is indicated by the light.
- Measuring 313m in length, its scale and the capacity to handle up to 100 000 passengers at peak periods.



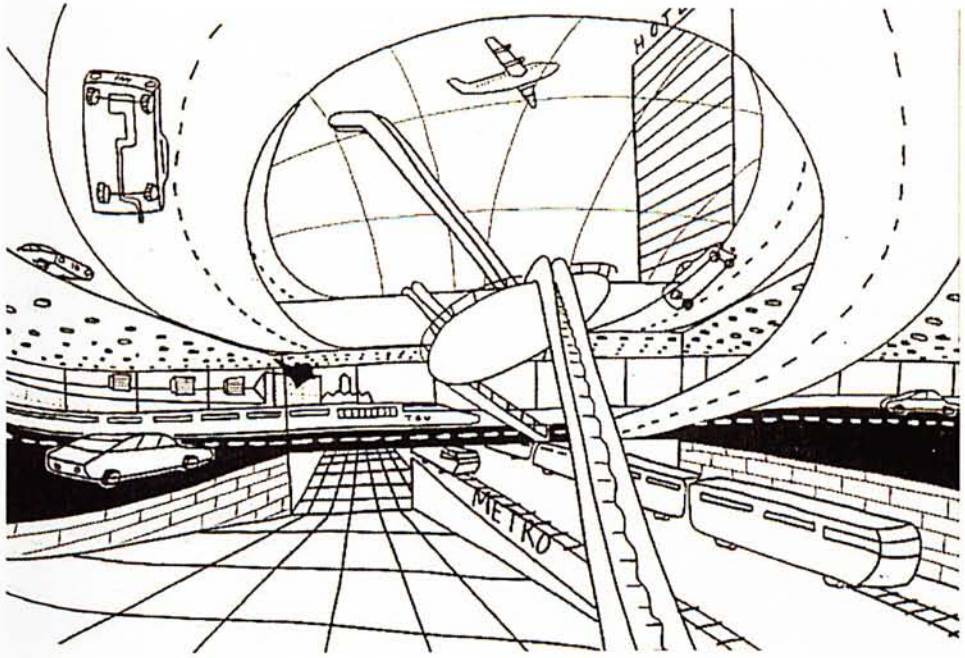


Porosity

CIRCULATORY POROSITY

Case Studies: Euralille, OMA

- The programme accumulates have been deliberately embedded in a diverse urban district and to ensure the diversity of functions with a rich network of public spaces linking the elements.
- Espace Piranesien as an intervention to reveal the infrastructural complexity.
- The central sector the Espace Piranesien was not an addition but a subtraction. At the point of the greatest infrastructural density, an absence of building reveals the highway, railway, parking, and the metro, which dive underneath the whole complex and reveal all the surrounding forces.



Porosity

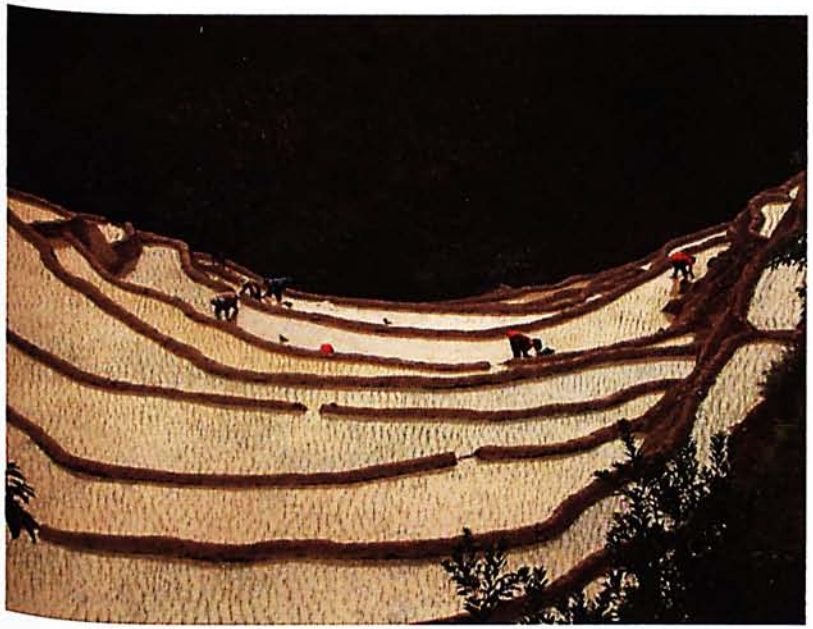
CIRCULATORY POROSITY

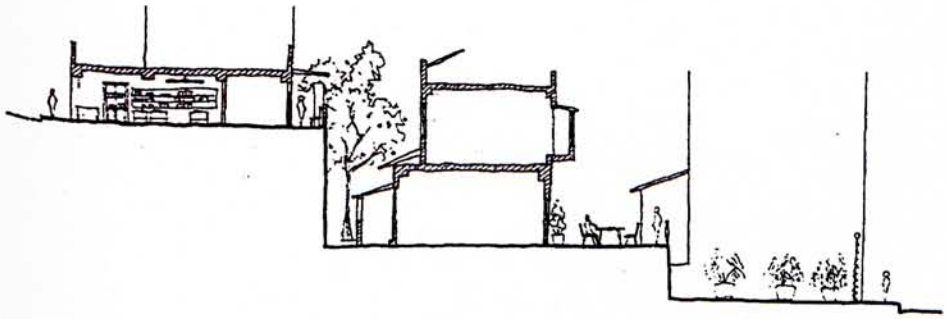
Case Studies: Souterrain The Hague, OMA

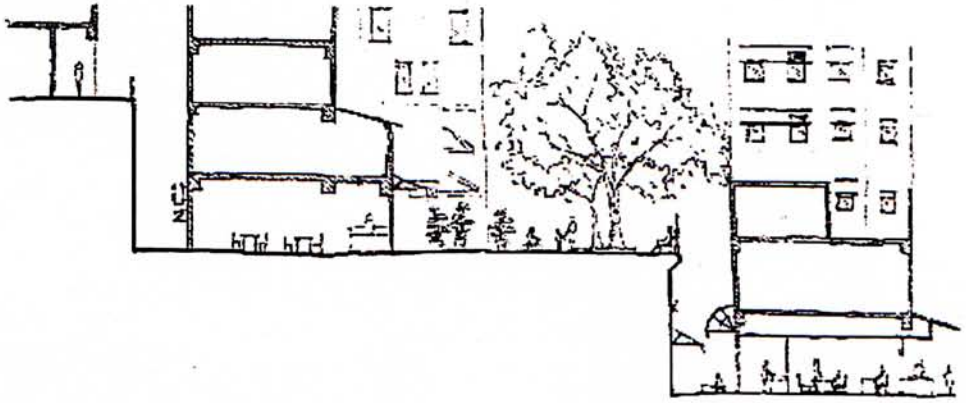
- Architecture can have positive effect when applied to the rigour of transport pragmatism.
- Its stretches out below the main shopping street, repeating its outlines, leaving a `workspace` of 600 by 15 m approximately, to overcome the boredom of a 600 m long continuous section
- Modification of height and width of space, to break away from isolation of underground

Terraced Landscape

To keep the topography of Old District



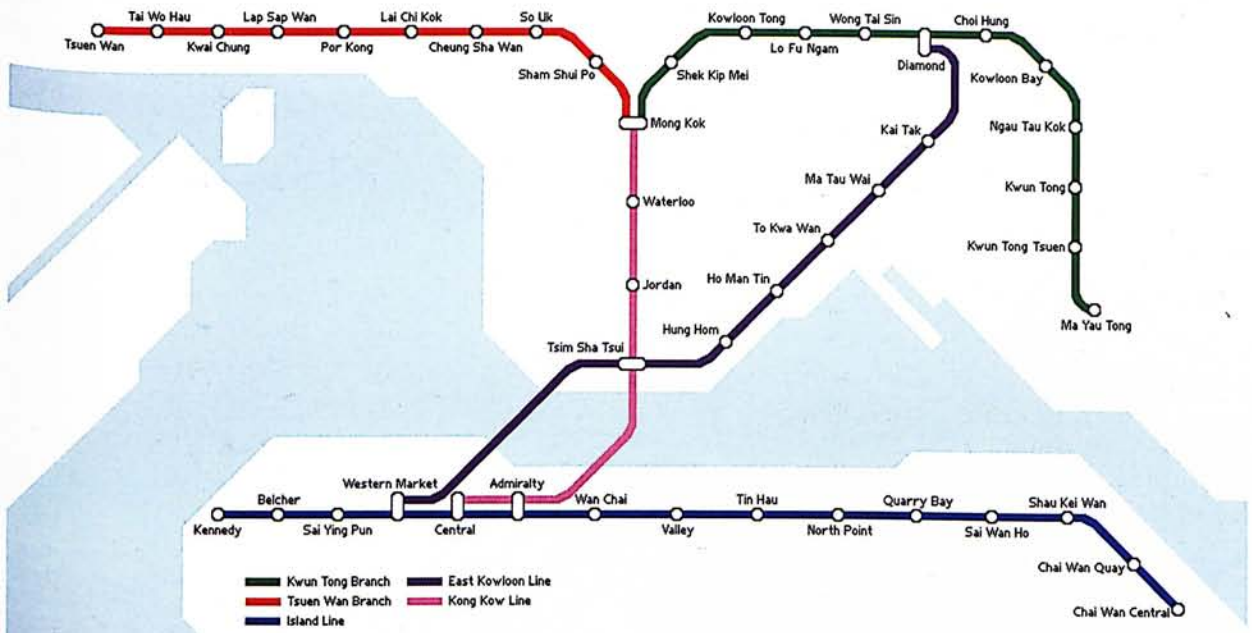




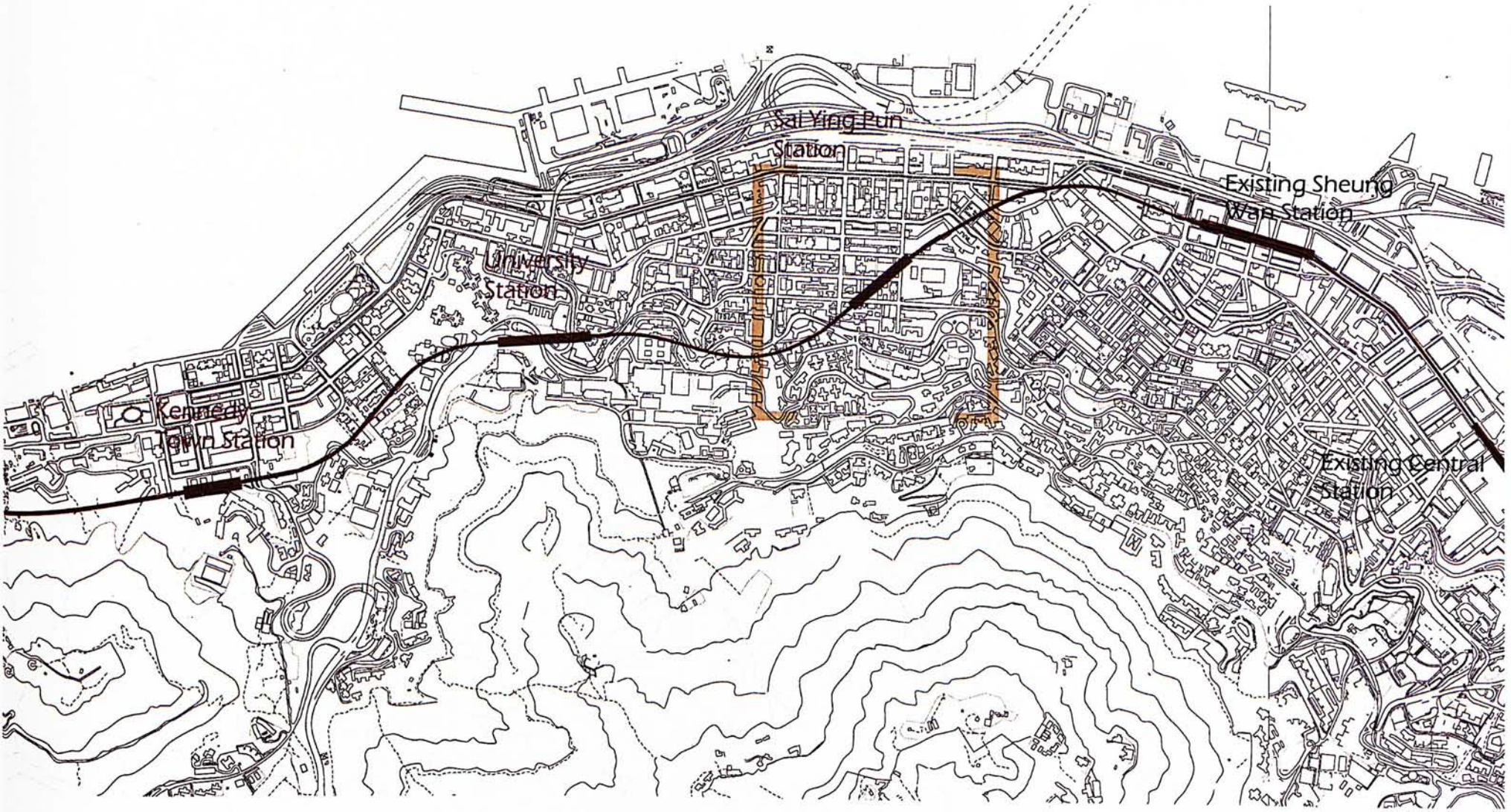
Sketch Section of terrace

5.0 Site Studies

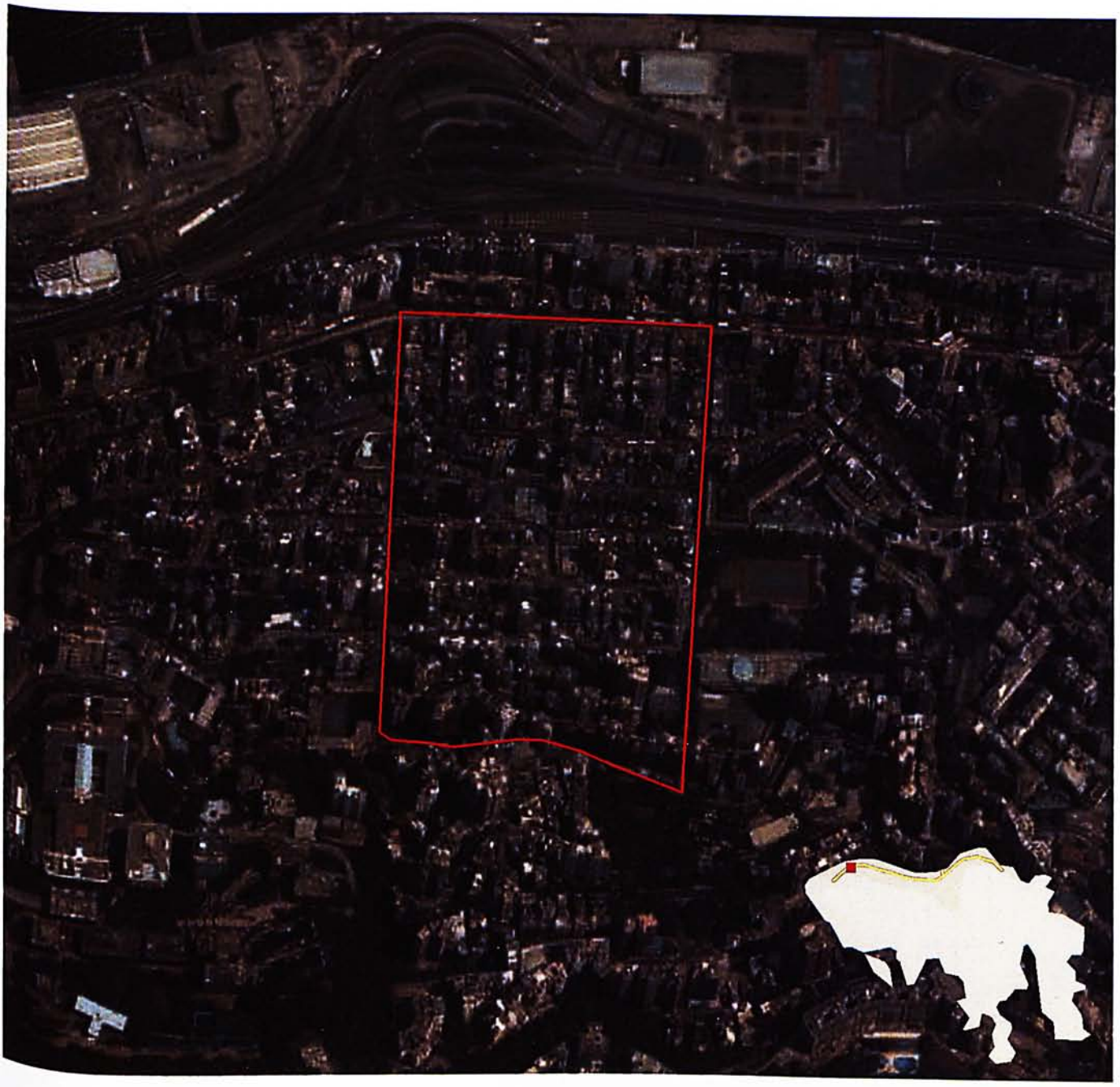
The West Island Line



The West Island Line



Site Studies - Sai Ying Pun



average salary

$16,110

population

20,607

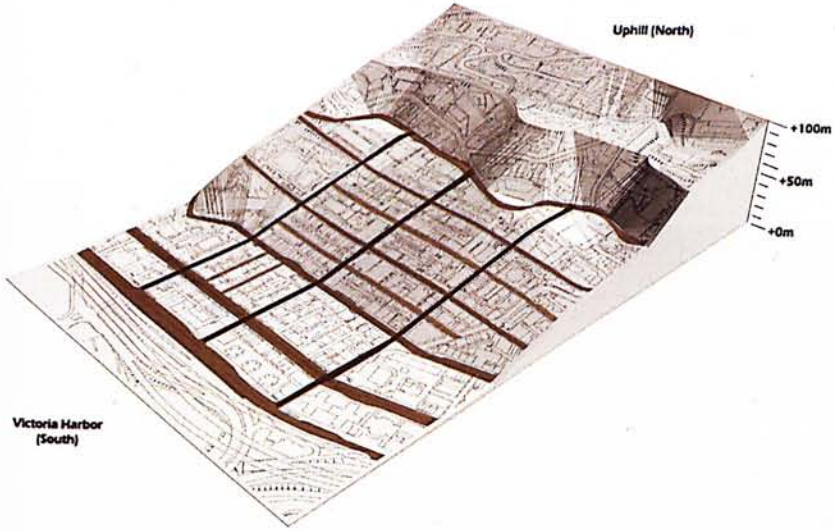
number of households

7,029

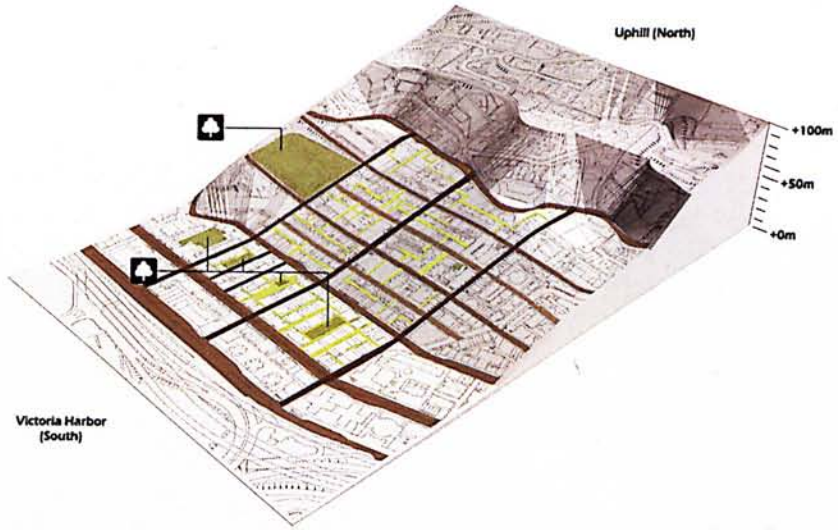
professionals & executive post

23.4%

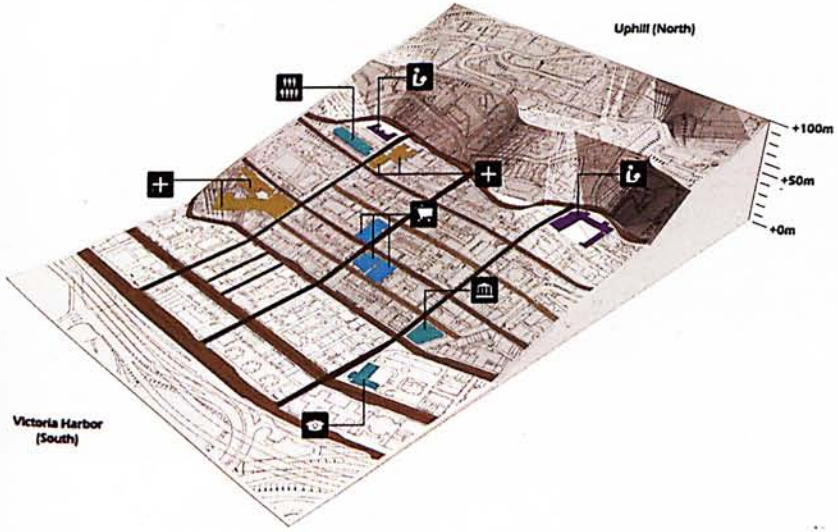
Site Studies - Sai Ying Pun



Topography and Road System Analysis

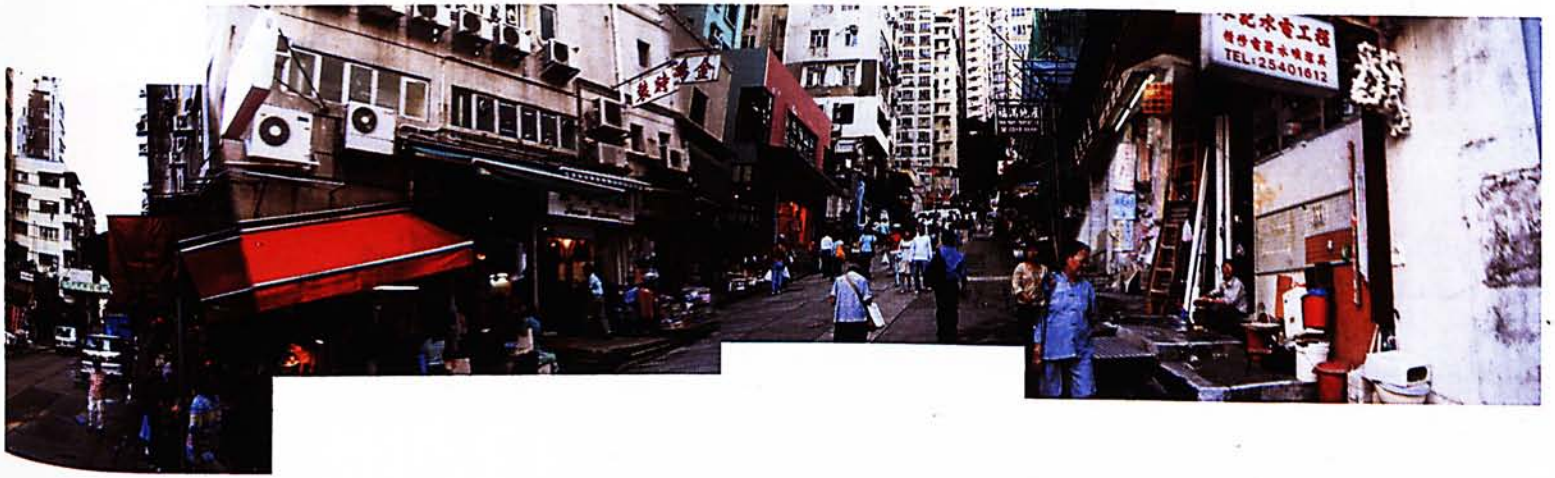


Existing Open Space Analysis

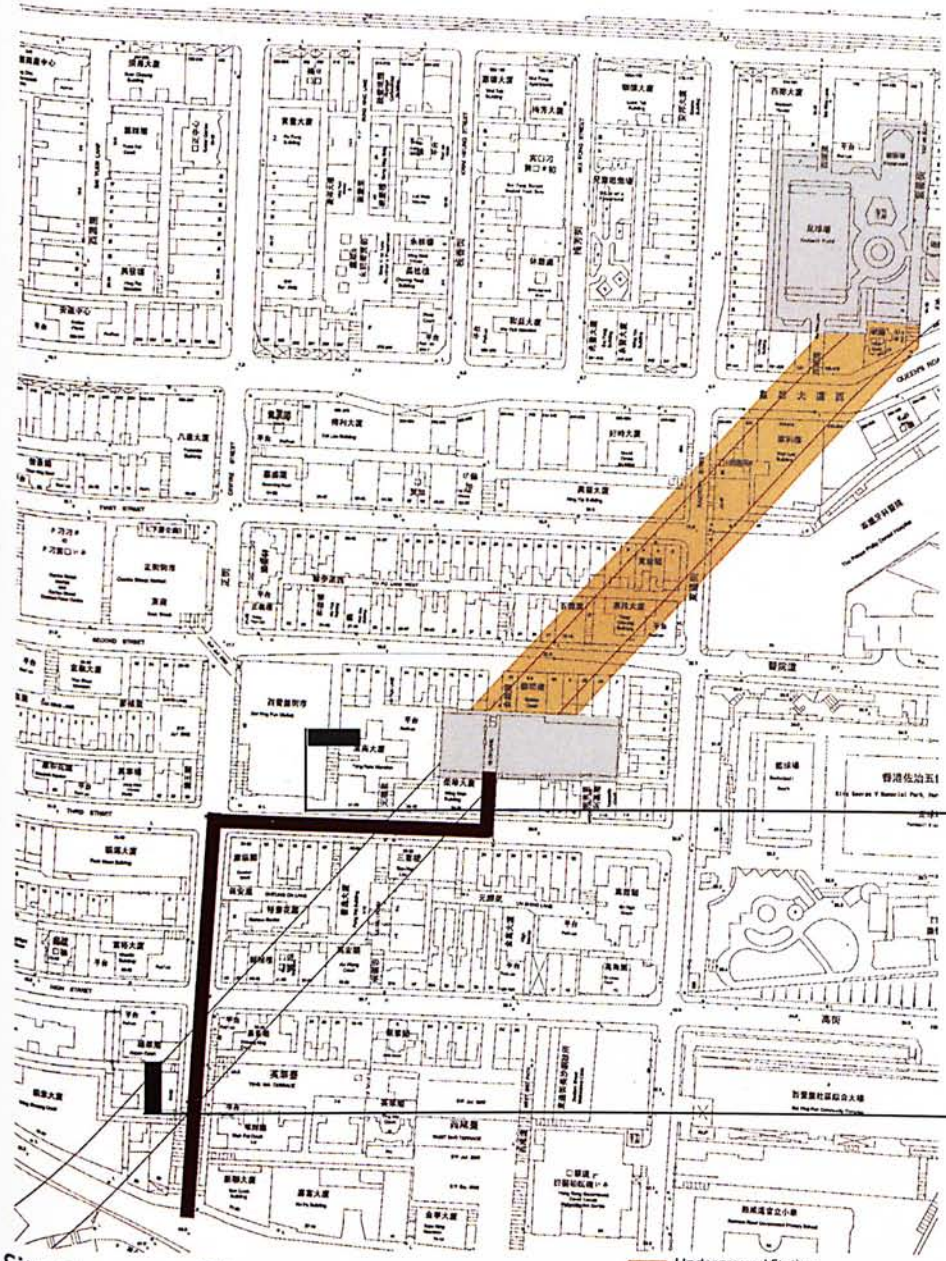


Existing Programme Analysis

Site Studies - Sai Ying Pun



Site Strategy

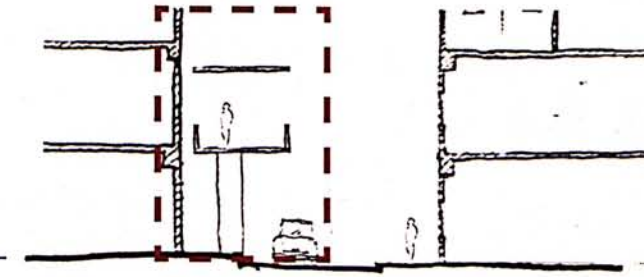


Site Strategy Diagram

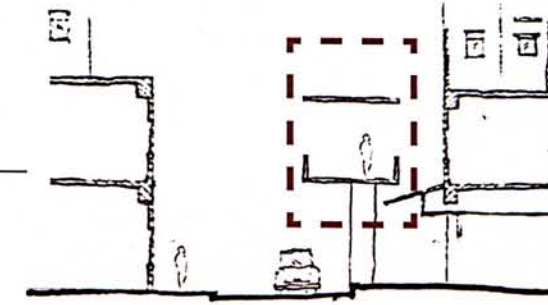
Underground Station

Existing Pocket Park as Station Entrance

Government Proposed Escalator System to Bonham Road



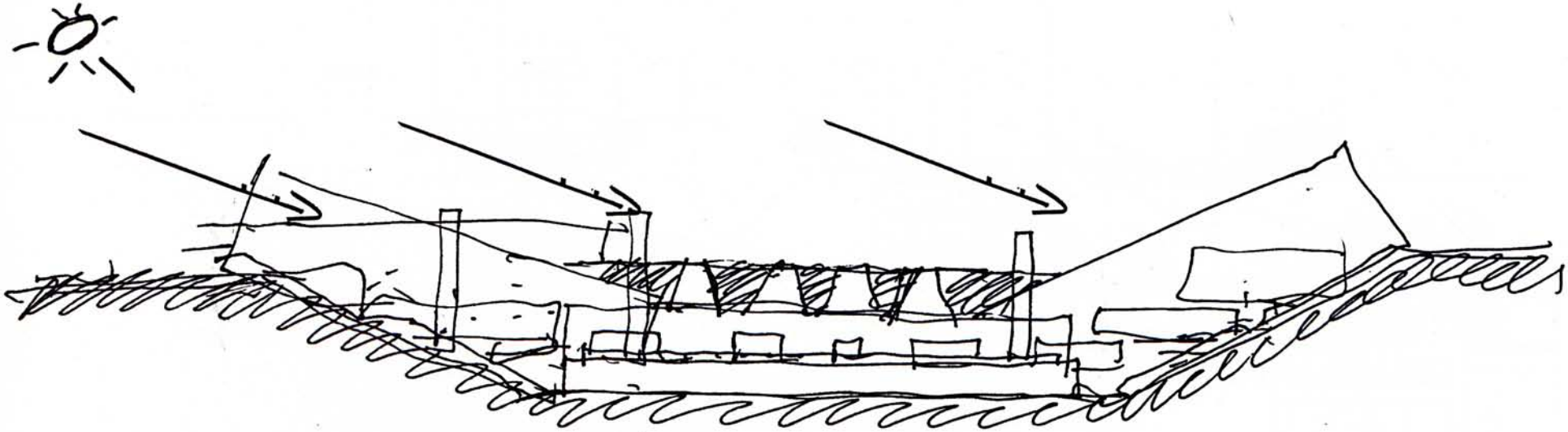
Sketch Section 1: Elevated Walkway along Third Street



Sketch Section 2: Elevated Walkway along Western Street

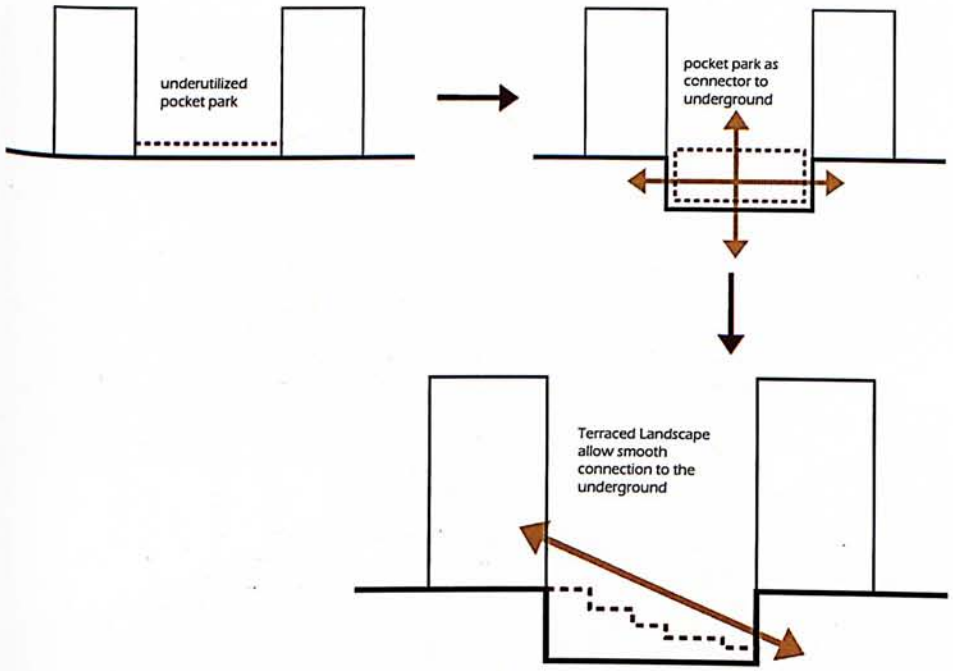
6.0 The Design

Preliminary Sketch

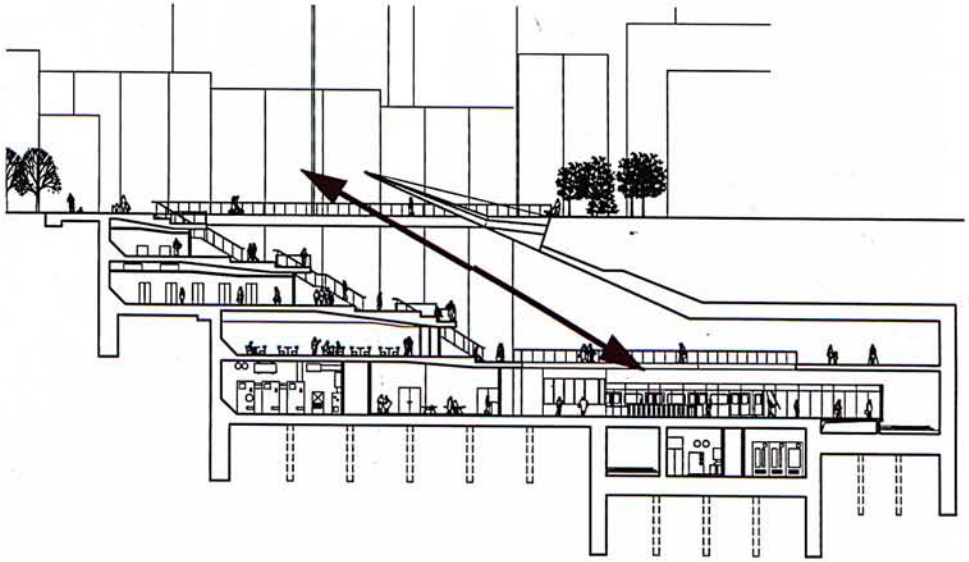


Design Element 1 - Terraced Lower Entrance

Design Development



Transverse Section



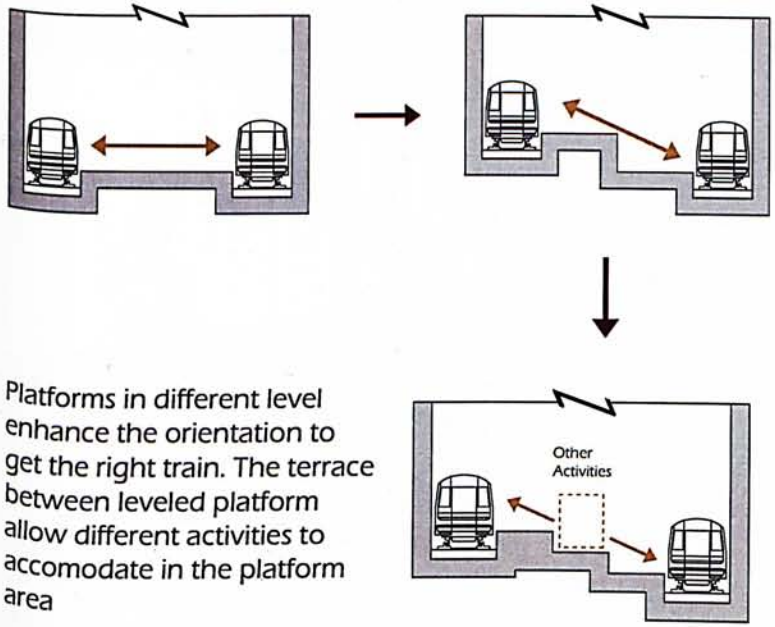
Visual connection from aboveground to platform established through the terraced entrance.

Design Element 1 - Terraced Lower Entrance

Activities on the Terrace

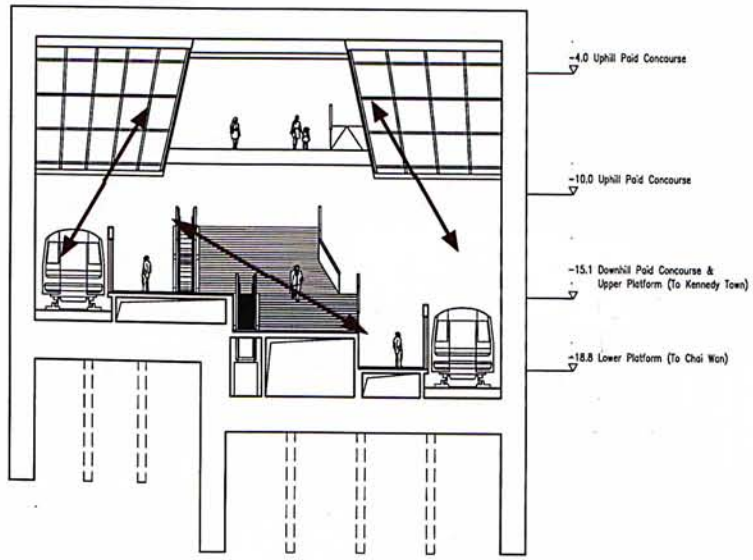
Design Element 2 - Leveled Platform

Design Development



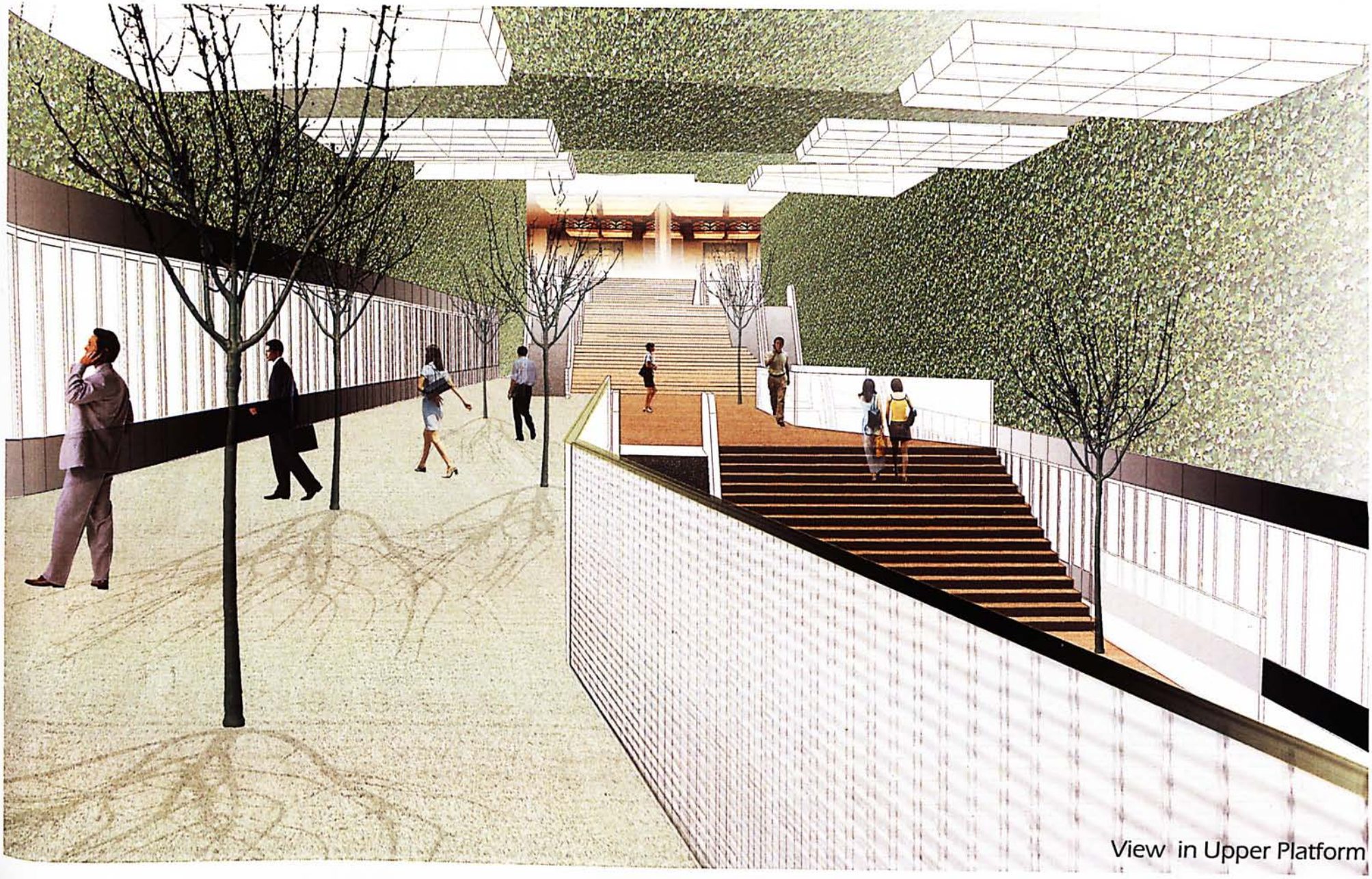
Platforms in different level enhance the orientation to get the right train. The terrace between leveled platform allow different activities to accomodate in the platform area

Transverse Section



Visual connection between 2 platforms and the 24 hours passageway through the platform terrace and light well

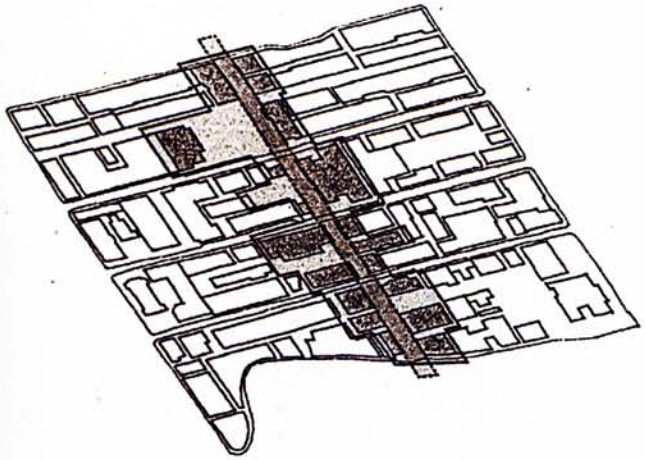
Design Element 2 - Leveled Platform



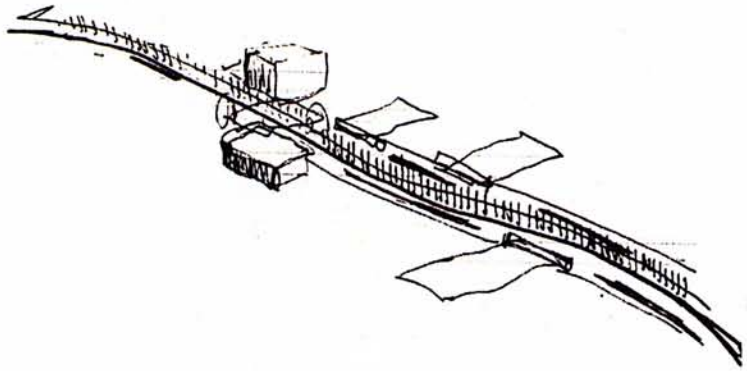
View in Upper Platform

Design Element 3 - 24 Hours Passageway

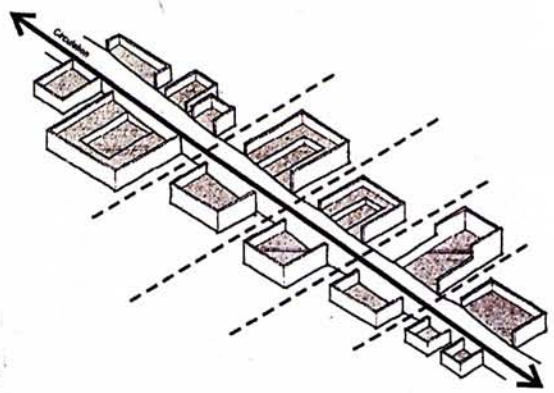
Design Development



Circulation pattern & pedestrian activities analysis through Centre Street

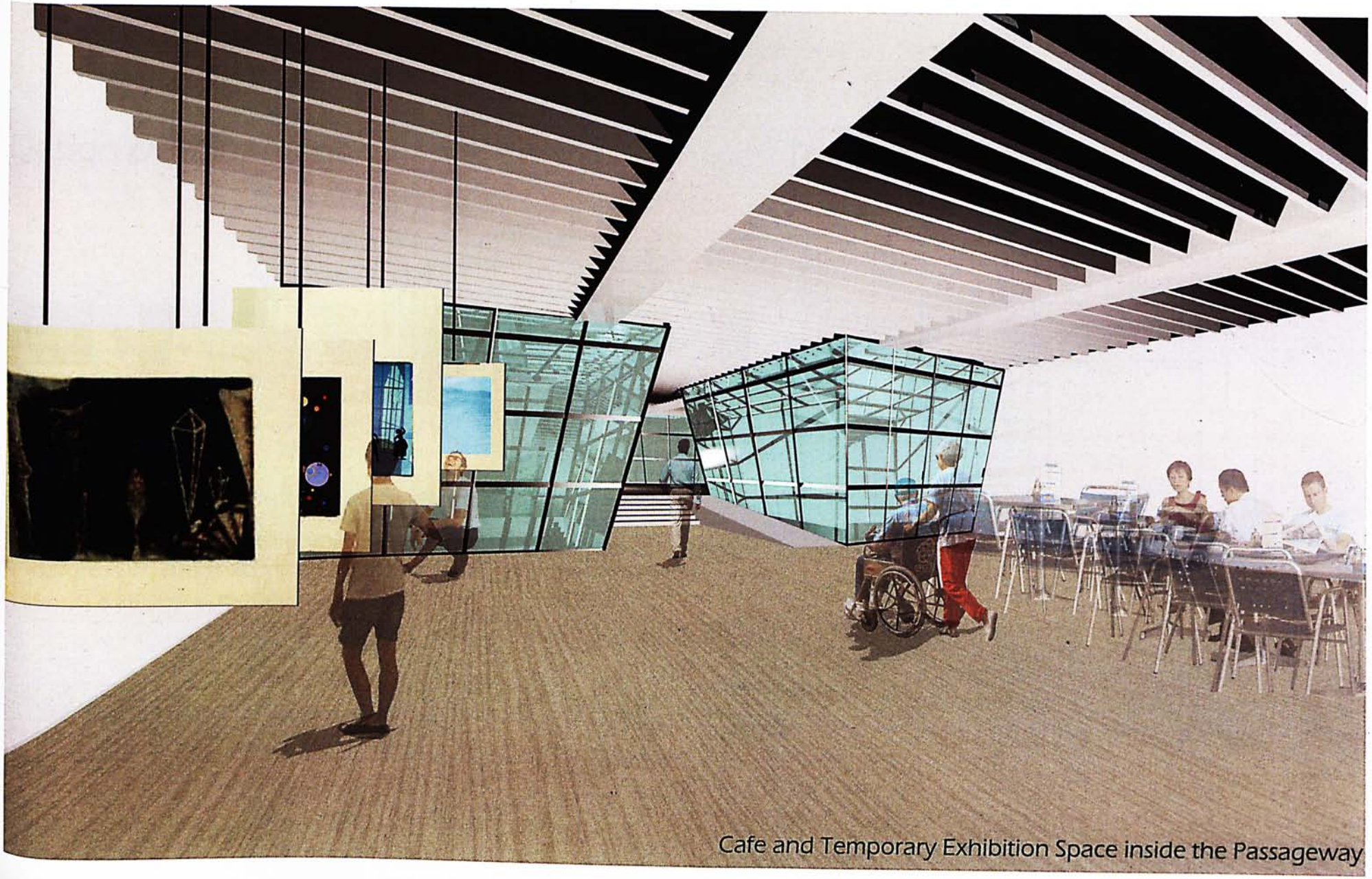


Sketch of the circulation spine of pedestrian activities through Centre Street



Sketch of preliminary form of the 24 hours passageway according to the spatial and circulation pattern of Centre Street

Design Element 3 - 24 Hours Passageway



Cafe and Temporary Exhibition Space inside the Passageway

Design Element 4 - Upper Entrance

Design Development

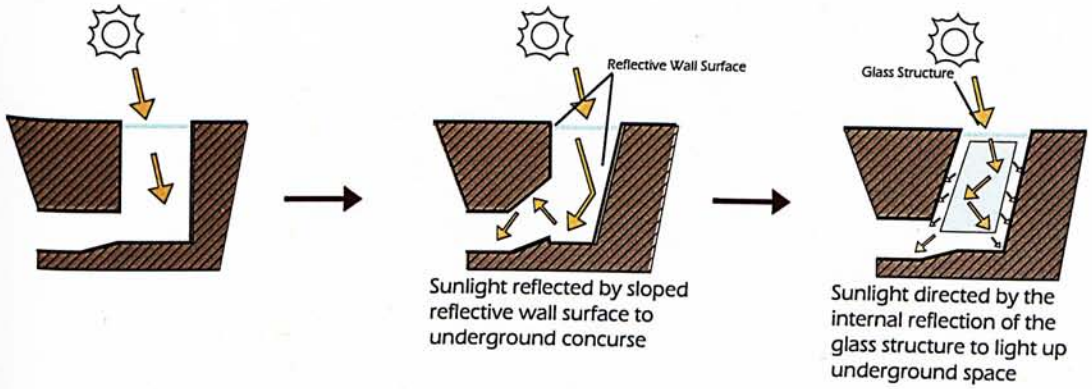
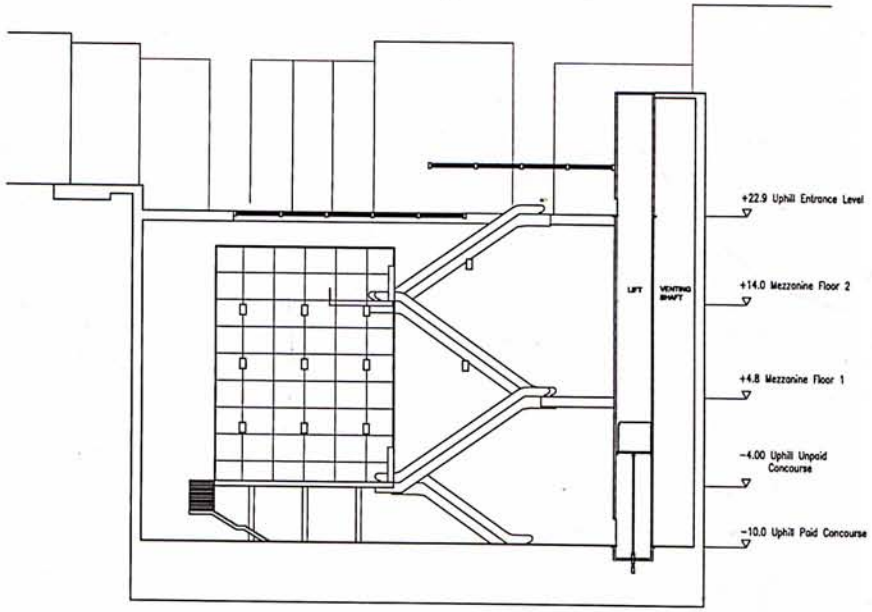
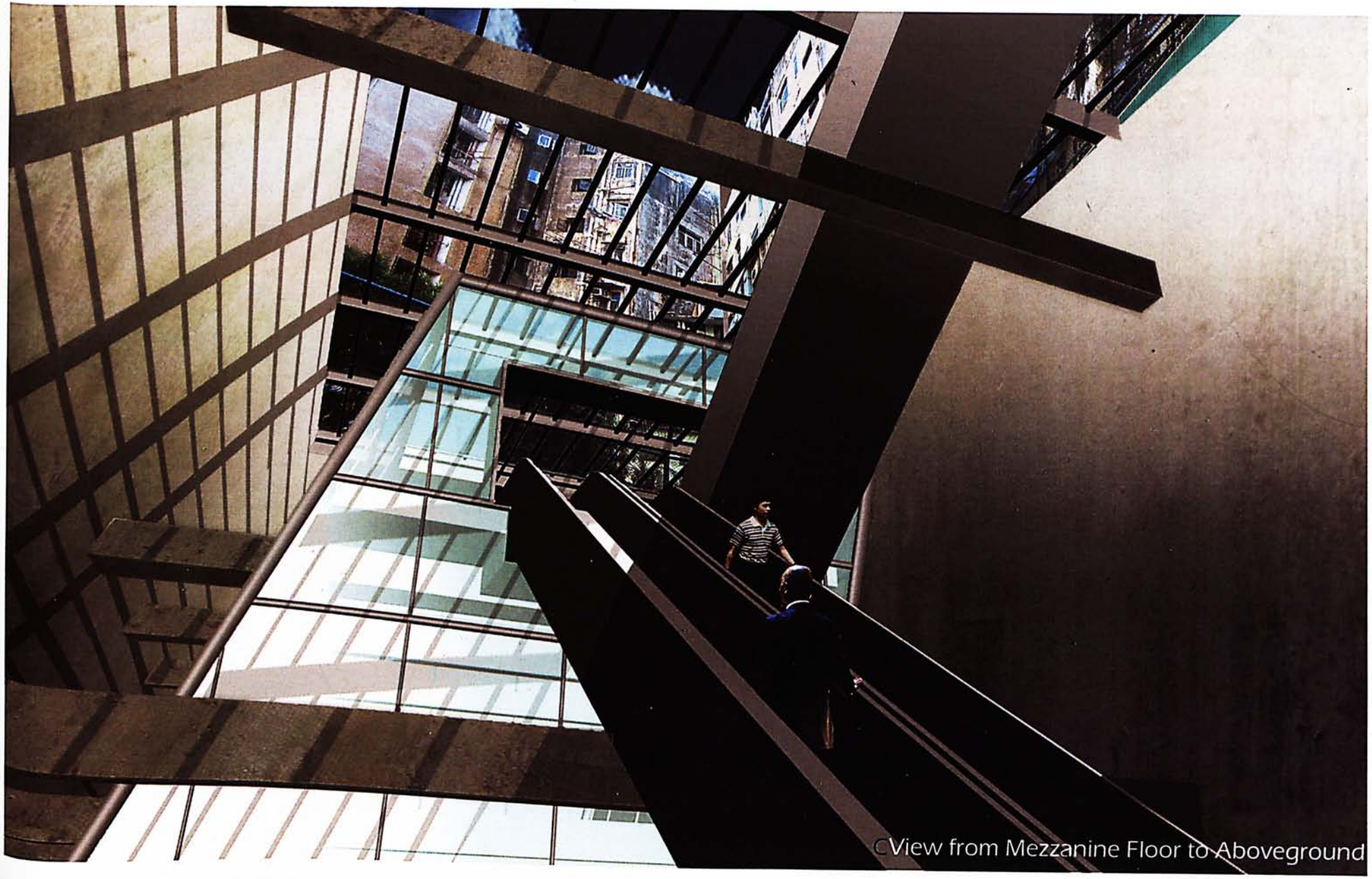


Diagram of the form development to bring sunlight to 25m underground. This is acheived by the internal reflection of light through a large suspended glass structure in the void.

Transverse Sectio

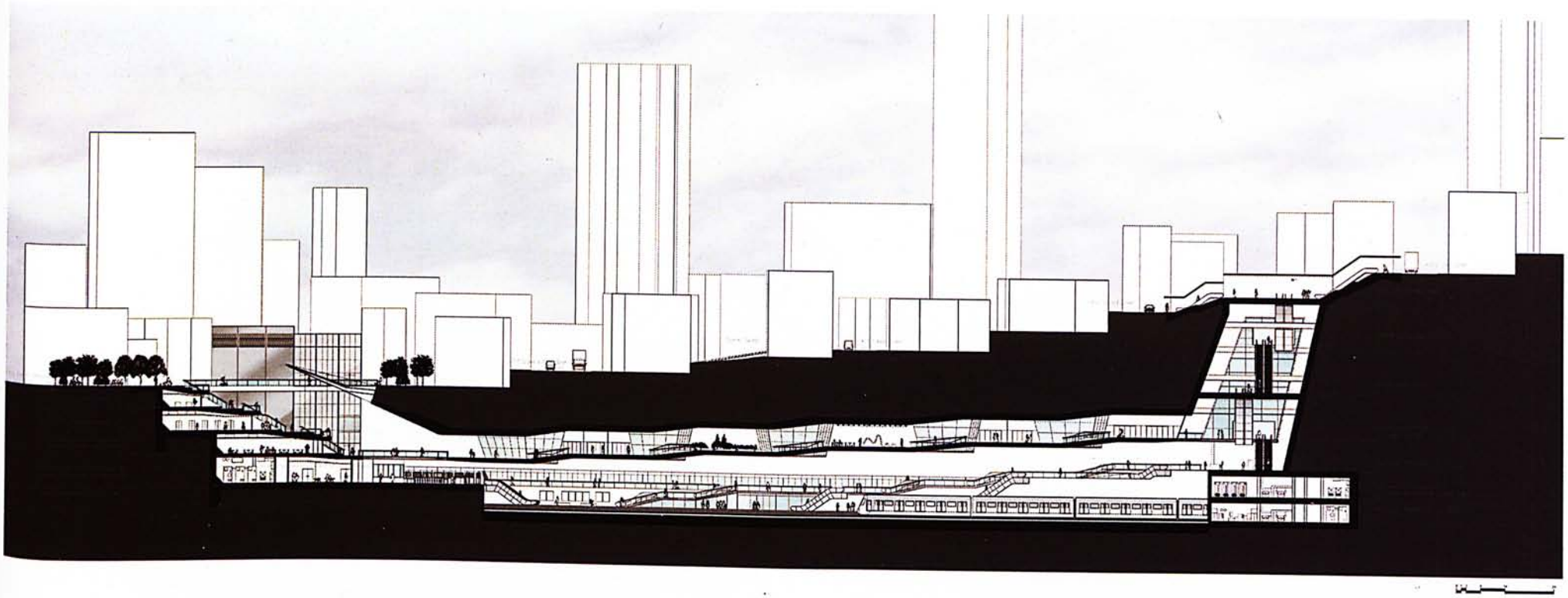


Design Element 4 - Upper Entrance

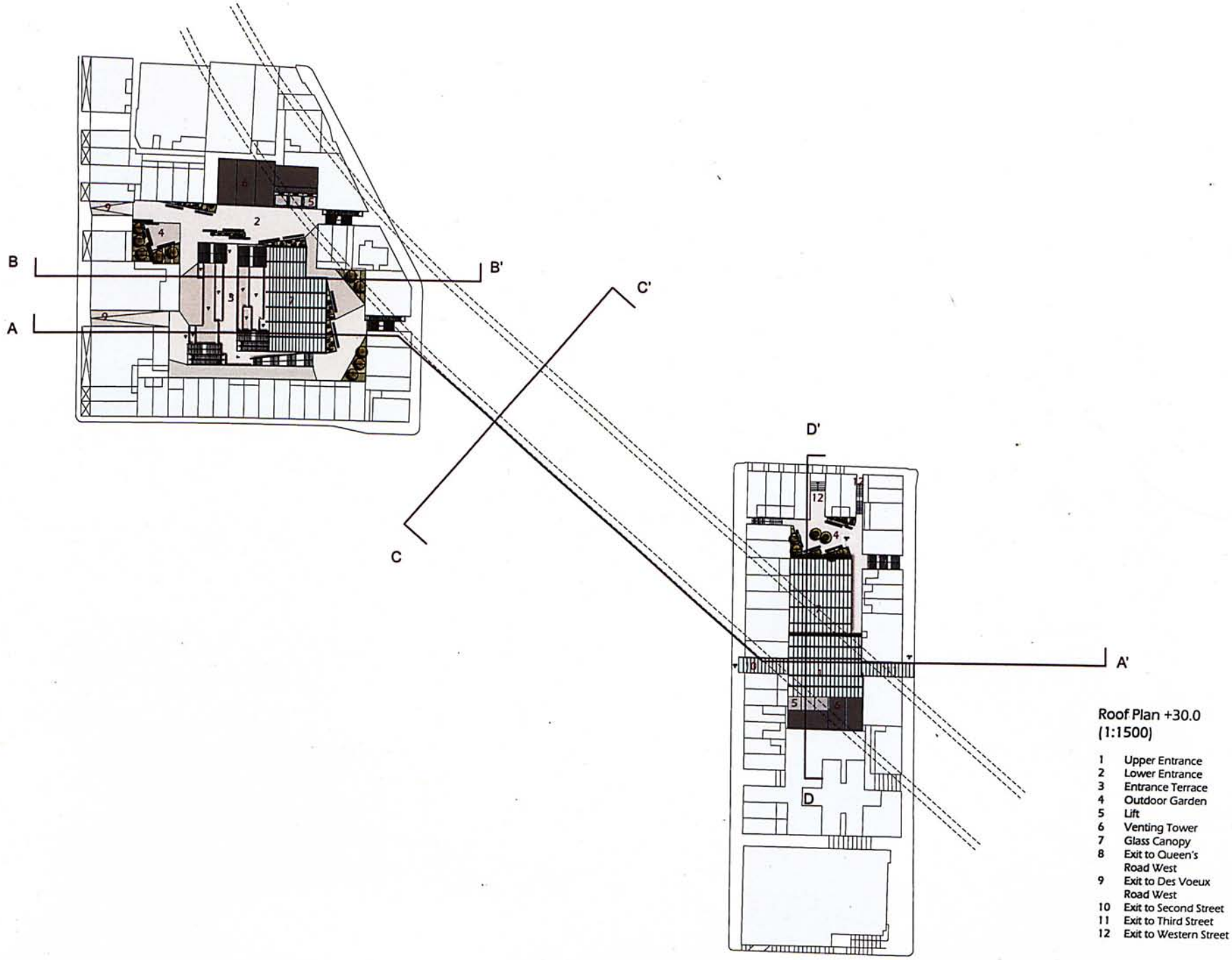


View from Mezzanine Floor to Aboveground

Overall Design



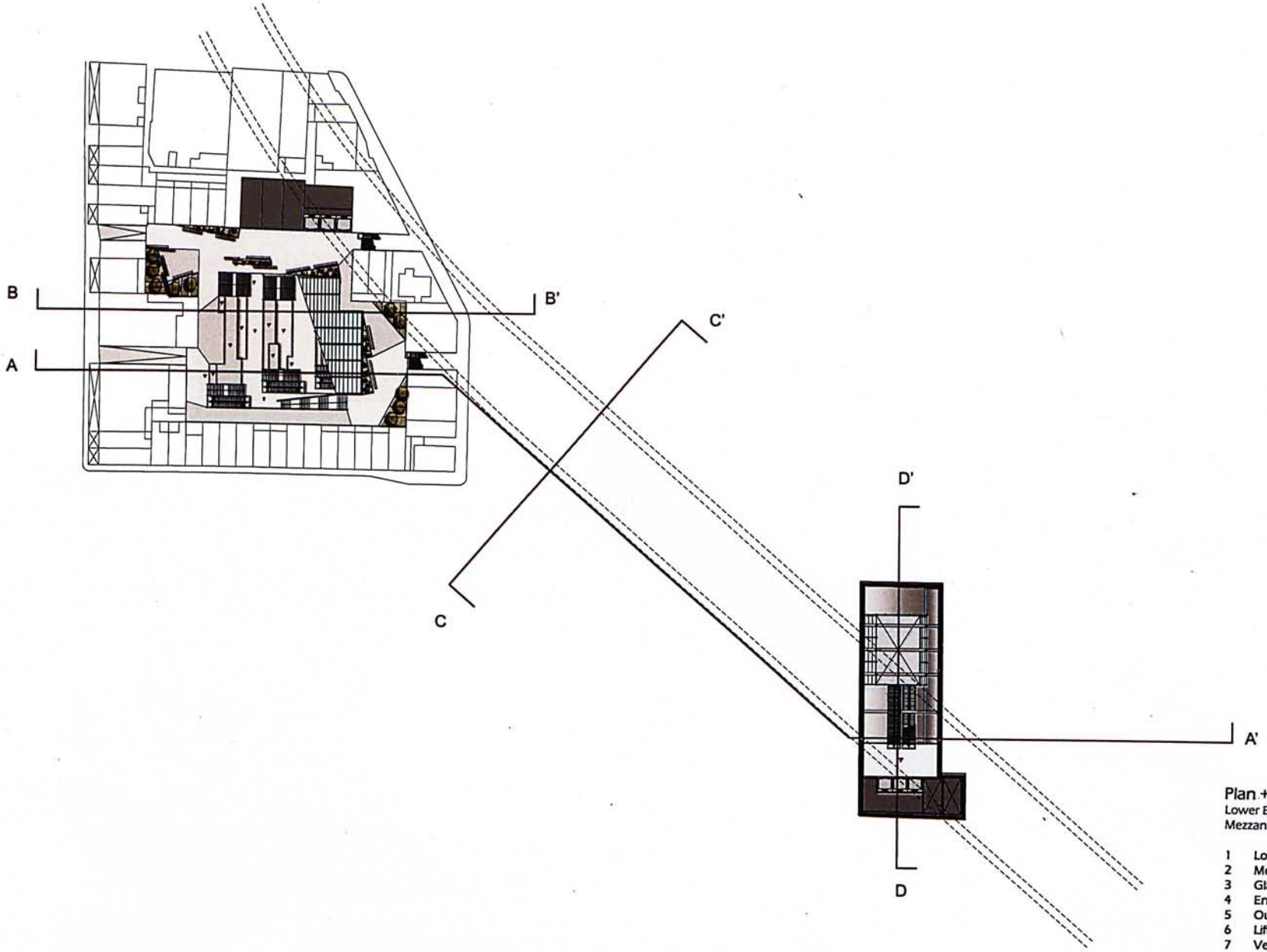
Overall Design



Roof Plan +30.0
(1:1500)

1 Upper Entrance
2 Lower Entrance
3 Entrance Terrace
4 Outdoor Garden
5 Lift
6 Venting Tower
7 Glass Canopy
8 Exit to Queen's Road West
9 Exit to Des Voeux Road West
10 Exit to Second Street
11 Exit to Third Street
12 Exit to Western Street

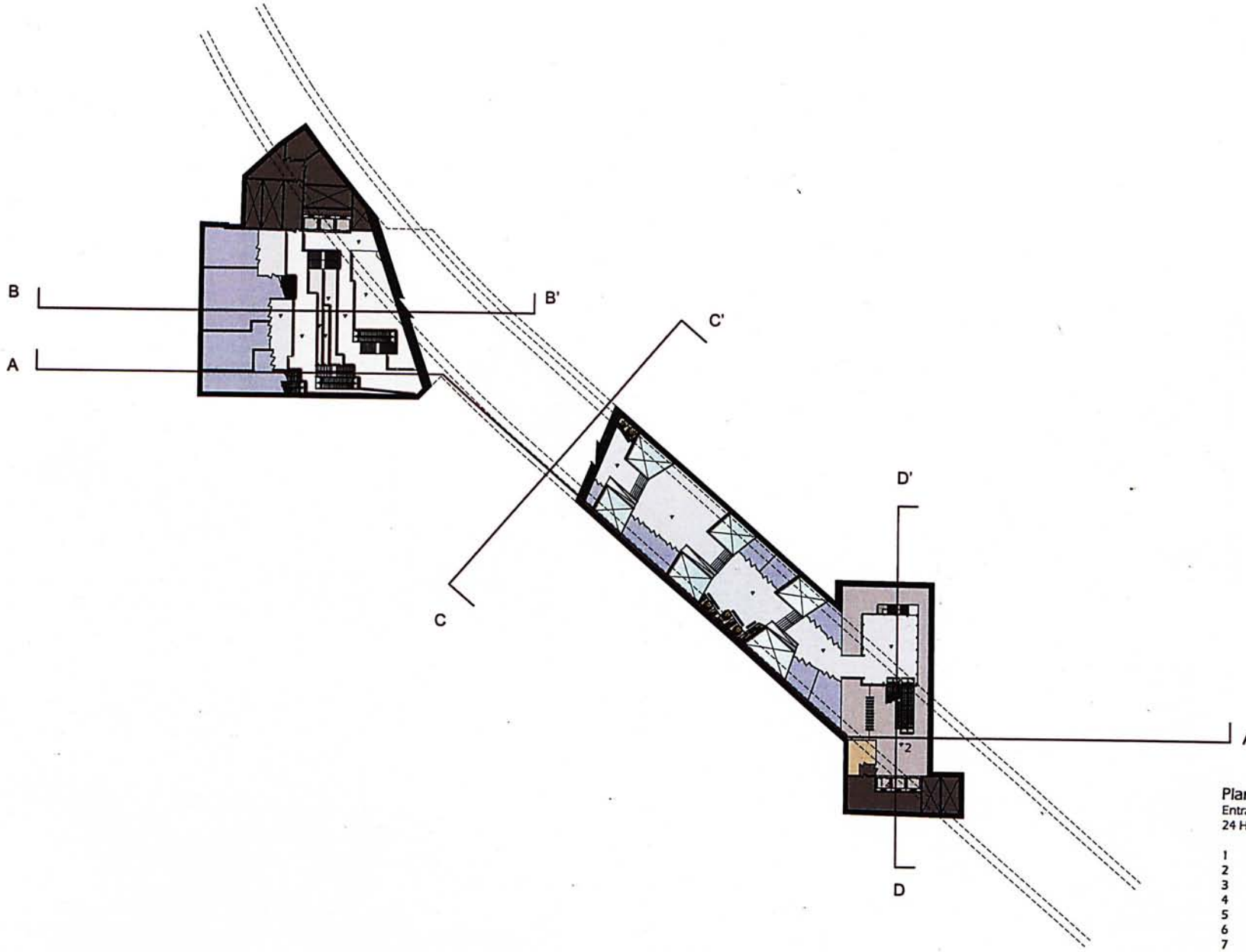
Overall Design



Plan +4.8 (1:1500)
Lower Entrance +
Mezzanine Floor 1

1 Lower Entrance
2 Mezanine Floor 1
3 Glass Structure
4 Entrance Terrace
5 Outdoor Garden
6 Lift
7 Venting Tower
8 Glass Canopy
9 Exit to Queen's Road West
10 Exit to Des Voeux Road West
11 Back of House/ Mechanical

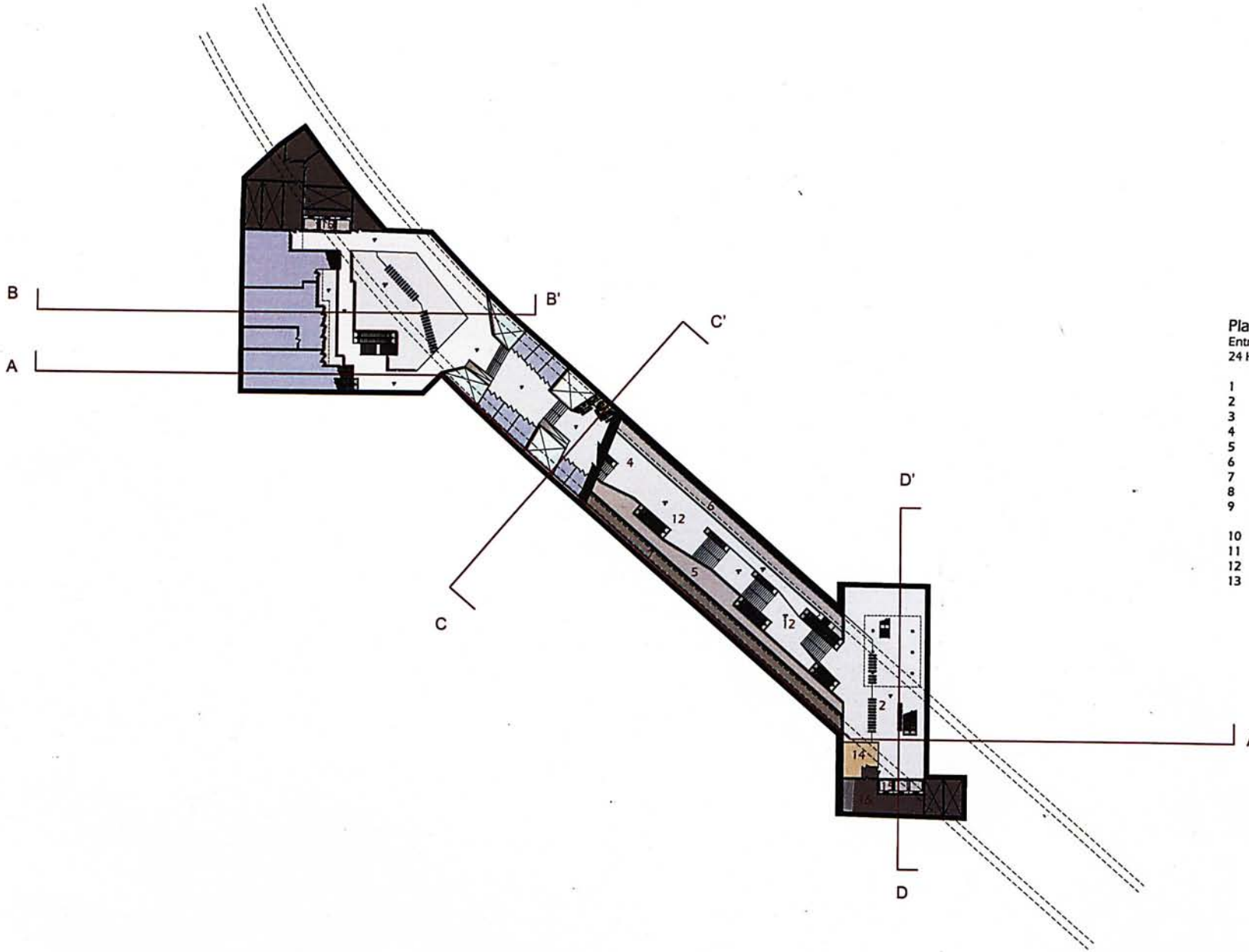
Overall Design



Plan -4.0 (1:1500)
Entrance Terrace 2/F +
24 Hours Passageway

1 24 Hours Passageway
2 Upper Concourse
3 Lower Concourse
4 Glass Structure
5 Entrance Terrace
6 Indoor Garden
7 Shops/ Grocery Store
8 Cafe/ Restaurant
9 Gallery/ Temparary Exhibition Space
10 Light Well
11 Ticket Office
12 Lift
13 Back of House/ Mechanical

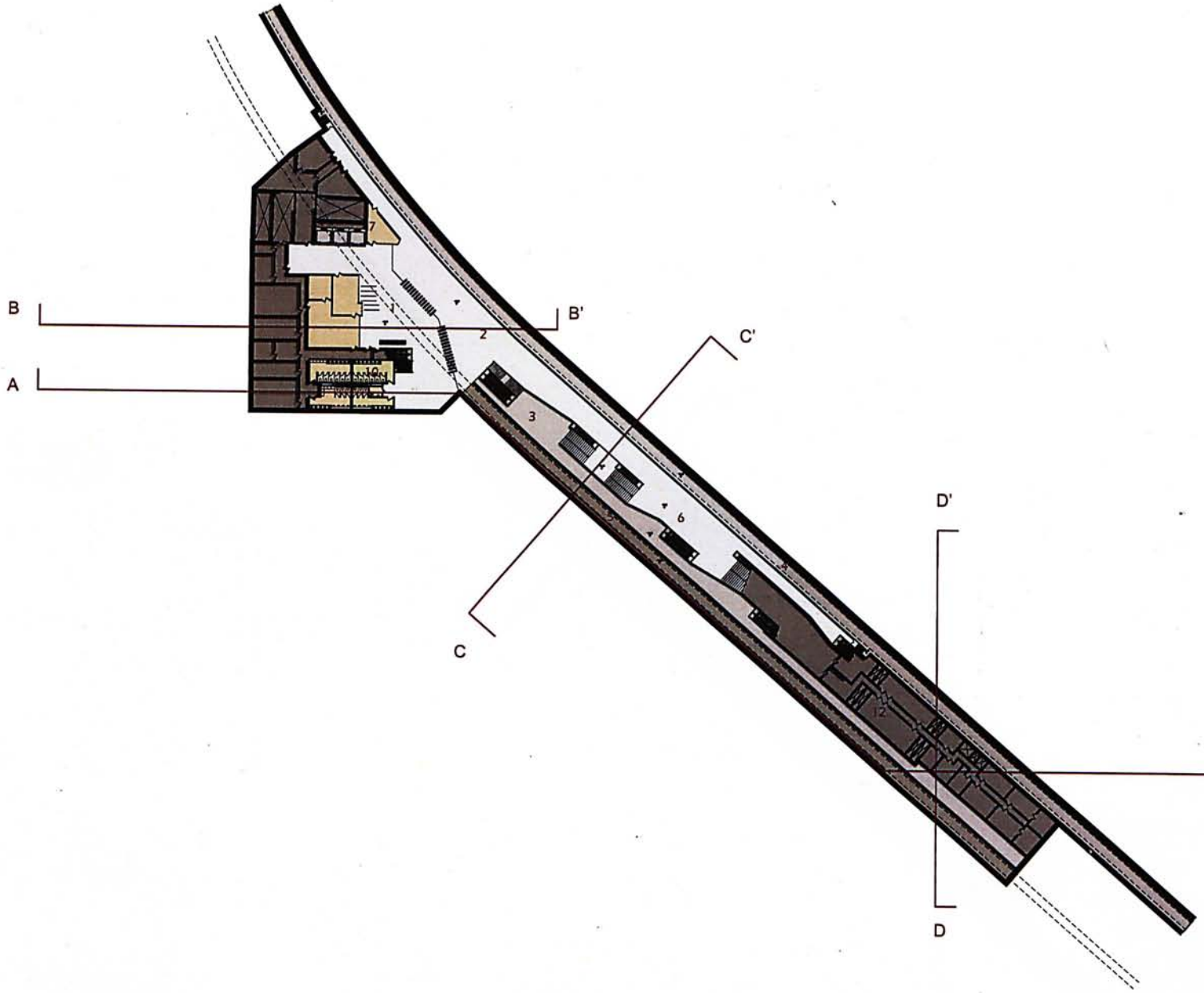
Overall Design



Plan -4.0 (1:1500)
Entrance Terrace 2/F +
24 Hours Passageway

1 24 Hours Passageway
2 Upper Concourse
3 Lower Concourse
4 Glass Structure
5 Entrance Terrace
6 Indoor Garden
7 Shops/ Grocery Store
8 Cafe/ Restaurant
9 Gallery/ Temparary Exhibition Space
10 Light Well
11 Ticket Office
12 Lift
13 Back of House/ Mechanical

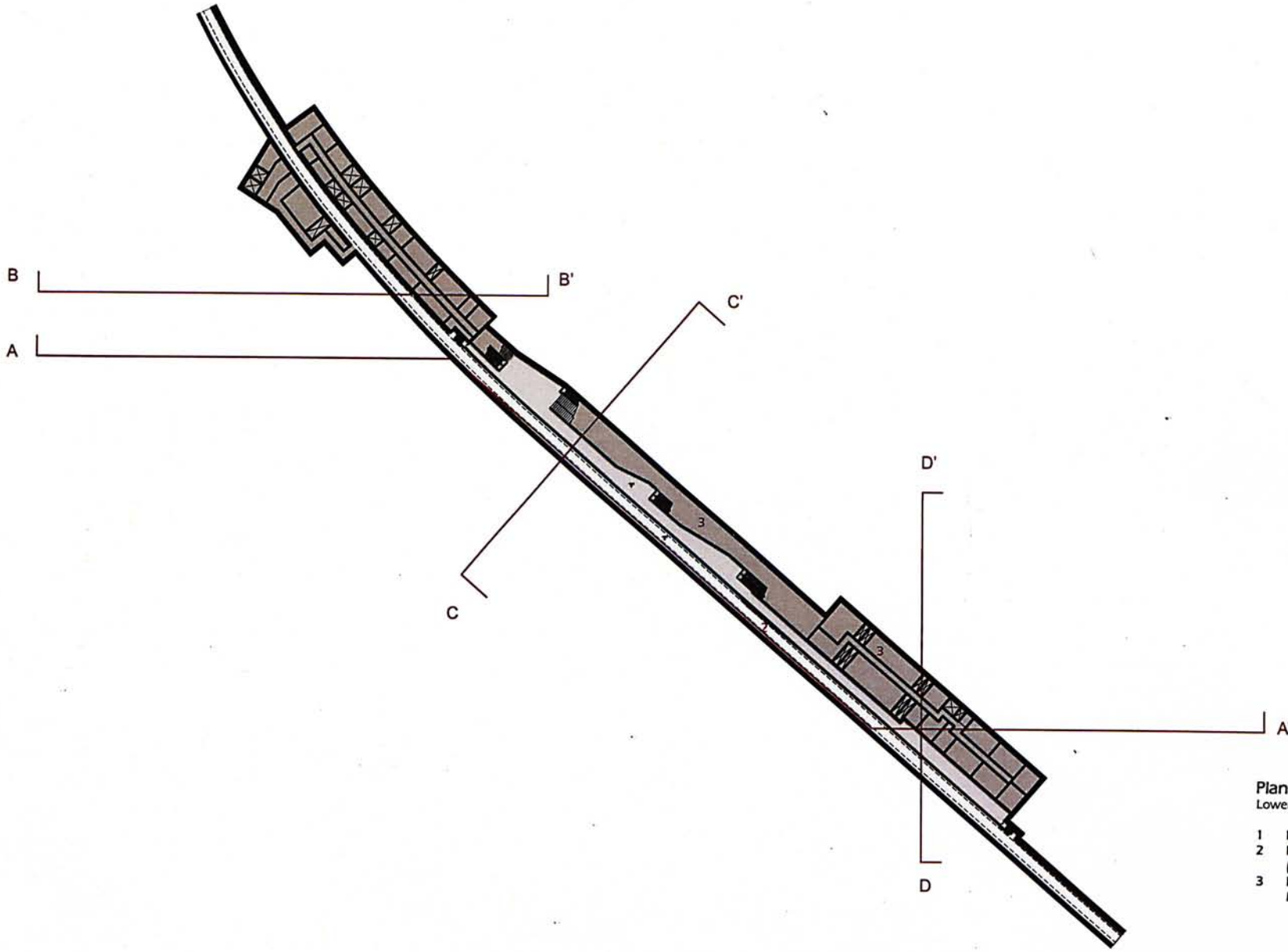
Overall Design



Plan -15.1 (1:1500)
Lower Concourse +
Upper Platform

1 Lower Concourse
2 Upper Platform
3 Lower Platform
4 Upper Track
(T0 Kennedy Town)
5 Lower Track
(To Chai Wan)
6 Gallery/ Temparary
Exhibition Space
7 Ticket Office
8 Station Office
9 Staff Facilities
10 Toilet
11 Lift
12 Back of House/
Mechanical

Overall Design



Plan -18.8 (1:1500)
Lower Platform

1 Lower Platform
2 Lower Track (To Chai Wan)
3 Back of House/ Mechanical